

Nutrition Final Research Paper

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Los Angeles

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NURS 225: Nutrition in Health and Disease

2019

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Part 1 THE DIET: Criteria One

J.W is a 60 year old African American male patient who weighs 230 pounds. He has been diagnosed with type II diabetes and hypertension. His current diet consists of high calorie and low nutrient foods. He consumes fast foods for the most part and eats out for three meals a day and lives a pretty sedentary lifestyle. Because J.W lives a pretty sedentary lifestyle, the high amount of calories that his body consumes from the fast food can lead to severe obesity and weight gain. Fast foods are generally very high in fat and carbohydrates because they are made with cheaper and lower quality ingredients that are less nutritious such as “high fat meat, refined grains, and added sugar and fats” (Fast food facts, 2019). According to Dudek, “Fast food tends to run high in calories, carbohydrates, sodium, cholesterol, trans fats, and saturated fats” (Dudek, 2014). Frequent consumption of a fast foods is the leading cause of obesity and CAD and can also lead to diabetes and hypertension, which J.W is already diagnosed with. Fast food generally are high in sodium and trans-fat which increase the LDLs in the body causing the blood pressure to increase and puts the patient at a higher risk for heart disease and possibly a stroke.

To look more in depth into J.W’s diet, lets pretend that for lunch, he goes to McDonald’s and orders a Big Mac meal with a medium fry and medium Dr Pepper. According to Dudek, “The Recommended Dietary Allowance (RDA) for **total carbohydrate is set at 130 g** for both adults and children, based on the average *minimum* amount of glucose that is needed to fuel the brain and assuming total calorie intake is adequate. The average intake of **total fat for both men and women aged 20 years and older is 34% of total calories** which translates to a mean intake of **95.3 g/day for men and 67.3 g/day for women**. The Recommended Dietary Allowance

(RDA) for protein for healthy adults is 0.8 g/kg ” (Dudek, 2014). A Big Mac at McDonald’s has a total of 46g of carbohydrates, a medium fry consists of 44g of carbohydrates and a medium Dr Pepper consists of 58g of carbohydrates. For one meal alone, J.W is consuming a total of 148g of carbohydrates. This exceeds the daily intake of carbs for an adult by 18g. Given the same meal, the Big Mac contains a total of 28g of fat, the fries contain 16g of fat and the soda contains a total of 0g of fat. This puts J.W’s total fat content for one meal at 46g of fat. For J.W’s weight and gender, he is set to consume a total of 83.6 g of fat daily. His total consumption of fat for one meal is almost over half of what is recommended for him. As for protein, the Big Mac contains 25g of protein, the fries contain 4g of protein and the Dr Pepper contains 0g of protein. J.W’s total protein intake for one meal is 29g. J.W travels three days a week and is always on the go. This example just shows a typical meal that he might consume in a day. With his current diet of eating out for three meals a day and consuming mostly fast foods, J.W seems to be consuming an excess amount of carbohydrates and fat and a low amount of protein.

Part 1 THE DIET: Criteria Two

Micronutrients are just as important as macronutrients in our daily diets. What are micronutrients? Micronutrients, according to Dudek, “nutrients that are needed in very small amounts” (Dudek, 2014). Because J.W consumes mostly fast foods, he is mostly likely deficient in micronutrients such as fiber. Most fast foods lack in fiber because they used refined grains. “Refined grains have been milled, a process that removes the bran and germ. This is done to give grains a finer texture and improve their shelf life, but it also removes dietary fiber, iron, and many B vitamins” (All about the grains group, n.d). For the most part, refined grains are enriched and do not have a proper amount of fiber in them. But fiber isn’t the only micronutrient that is

lacked in fast foods. Some other micronutrients that J.W might lack in include calcium, potassium, iron and the different types of vitamins. Because fast food ingredients are mostly processed, it is most likely that they lack in vitamins and minerals. Most processed foods have a ton of additives to ensure that their shelf life is extended. Below are the micronutrients that are in the Big Mac meal derived from myfitnesspal.

Potassium	0	3,500	3,500mg	>
Vitamin A	4	100	96%	>
Vitamin C	2	100	98%	>
Calcium	25	100	75%	>
Iron	25	100	75%	>

The total potassium for the Big Mac deal would be 0g, total vitamin A would be 4g, total vitamin C would be 2g, total calcium would be 25g and total iron would be 25g. Vitamins and minerals are sensitive to processing and considering fast food is mostly made up of processed foods, it is safe to say that anyone who consumes a large amount of fast foods will not meet the RDA for micronutrients. “Fast food is high in energy and low in essential micronutrient density” (Hashem, Mohamed, 2008).

Part II DISEASE AND NUTRITION: Criteria 1

J.W has been diagnosed with Type II diabetes and Hypertension and this most likely is due to his poor diet and sedentary lifestyle. African American's are put at a much higher risk for stroke and heart disease. J.W's diet consists mainly of high fat and high carbohydrate foods and keeping up with this diet definitely puts him at a higher risk for heart disease and stroke. J.W eats out for three meals a day and probably chooses fast food places because they are fast and convenient for him since he's always traveling and on the go.

For breakfast, J.W might stop at Starbucks and order a venti Frappuccino. A venti coffee Frappuccino according to the Starbucks website, has a total 59g of sugar and 60g of carbohydrates. Drinking a Starbucks Frappuccino is high in sugar and will definitely spike his blood sugar, and because type II diabetes is when the body doesn't make enough insulin or is insulin resistant, his glucose levels will definitely spike. Alongside the Frappuccino, J.W might also order a sausage, cheddar and egg breakfast sandwich. According to the Starbucks website, this sandwich contains 29g of total fat, and 880mg of sodium. According to the American Heart Association, they recommend "no more than 2,300 milligrams (mg) a day and moving toward an ideal limit of no more than 1,500 mg per day for most adults" (How much sodium should I eat per day, n.d). This leaves J.W 620mg of sodium left to consume for the rest of his day so he doesn't exceed his recommended daily intake. Because the breakfast sandwich is pretty high in sodium, his blood pressure will increase. This meal alone will spike his glucose level as well as raise his blood pressure.

For lunch or dinner, J.W might stop at McDonald's and get a medium size Big Mac meal. As discussed earlier, the Big Mac meal is high in fat and cholesterol. The Big Mac has a total of

950mg. After consuming his Starbucks breakfast and then consuming the Big Mac sandwich alone, this puts J.W's sodium intake for two meals at 1830mg . Foods like this will cause an increase in LDL's in the body and will cause an increase in blood pressure.

Part II DISEASE AND NUTRITION: Criteria 2

J.W currently takes 500mg of Metformin BID for his type II diabetes, 200mg of Metoprolol daily for his hypertension, and he also takes a multivitamin. According to the Davis Drug Guide, metformin “decreases hepatic glucose production and decreases intestinal glucose absorption” (Vallerand, Sanoski, Quiring, 2019). When taking metformin, it is important to avoid drinking alcohol because it can increase the risk for developing low glucose levels. Because J.W also takes a multivitamin, it is also important to note that Vitamin B-12 interacts with metformin. Metformin prevents the absorption of B12 into the bloodstream via the small intestine. “In 1969, Berchtold et al (1) reported evidence of vitamin B12 malabsorption in patients who had been treated with metformin for as little as 3 months” (Aroda, Goldberg, Knowler, 2016). This lead to the conclusion that the use of metformin may cause a Vitamin B-12 deficiency. This study recommended a routine blood draw for Vitamin B-12 and calcium for patients who are taking metformin.

Another medication J.W is metoprolol. This medication is an antihypertensive. According to the Davis Drug Guide, metoprolol “blocks stimulation of beta1(myocardial)-adrenergic receptors. Does not usually affect beta2(pulmonary, vascular, uterine)-adrenergic receptor sites” (Vallerand, Sanoski, Quiring, 2019). Metoprolol can put some patients at risk for hyperkalemia. A case study was done on a 72 year old female client who had diabetes and underlying chronic renal failure who was also receiving metoprolol and later on developed hyperkalemia. According to the article, “Beta-blockers, when used in patients with comorbidities

such as renal dysfunction or insulin insufficiency, can potentially cause hyperkalemia. As demonstrated in this case report, hyperkalemia can occur in patients treated with cardio-selective beta-blockers with concurrent risk factors” (Hawboldt, McGratch, 2006). Hyperkalemia is increased levels of potassium in the blood, it is important to educate the patient to reduce the amount of potassium in their diets. Alcohol is also contraindicated with this medication because it can cause severe hypotension that can lead to hospitalization. According to the Davis Drug Guide, metoprolol “may alter the effectiveness of insulins or oral hypoglycemic agents” (Vallerand, Sanoski, Quiring, 2019). The drug guide suggests that dose adjustments might be necessary.

Part III PATIENT EDUCATION: Criteria 1

J.W currently weighs 230lbs and is 6 feet tall. According to Dudek, “Body Mass Index (BMI) is a person's weight in kilograms (kg) divided by his or her height in meters squared” (Dudek, 2014). J.W’s BMI calculated is as follows:

6 feet= 72 inches

72 inches=1.8288 meters

230lbs=104.5kg

$1.8288\text{ m} \times 1.8288\text{ m} = 3.34450944\text{ m}^2$

FORMULA:

$\text{BMI} = \text{weight (kg)} / \text{height (m}^2\text{)} = 104.32636\text{ kg} / 3.34450944\text{ m}^2 = 31.1933247736\text{ kg/ m}^2$

J.W’s BMI is set at 31.2 and is considered to be obese.

BMR also known as Basal Metabolic Rate, according to Dudek, is defined as “the amount of calories expended in a 24-hour period to fuel the involuntary activities of the body at

rest and after a 12-hour fast” (Dudek, 2014). One way to calculate one’s BMR is by using the Harris-Benedict Equation. Calculations of J.W’s BMR is as follows:

EQUATION:

$$\text{BMR} = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) + 5$$

J.W’s INFORMATION:

$$\text{Height in cm} = 6 \times 30.48\text{cm} = 182.88\text{cm}$$

$$\text{Weight in kg} = 104.32636 \text{ kg}$$

FORMULA:

$$\text{BMR} = (10 \times 104.32636) + (6.25 \times 182.88) - (5 \times 60) + 5$$

J.W’s BMR is set at 1891.3

J.W lives a sedentary lifestyle so we would take his BMR or 1891.3 and multiply it by 1.2 to calculate how many calories he should be taking in a day. After the calculations, this puts J.W’s daily calorie intake at 2,269.5 calories a day in order to maintain his weight.

J.W is instructed to lose 1 lb a week for three months. In order for that to happen, he needs to reduce the amount of calories that he is taking in by atleast 3,500 calories per week .Ways that he can achieve this is by simply tracking his calories or by exercising to burn the calories. If J.W decides to workout, he must burn 700 calories a day for 5 days a week.

J.W should incorporate moderate exercise to his daily routine in order to reach his goals of losing 1 pound a week. According to the American Heart Association, “To improve overall cardiovascular health, we suggest at least 150 minutes per week of moderate exercise or 75

minutes per week of vigorous exercise” (American Heart Association, n.d). Walking briskly for 30 minutes a day for 5 days out of the week will benefit J.W.

J.W has a goal of losing 1 pound per week. Carbohydrates are one of the main sources of energy that our bodies use and they should be the largest percentage of a person’s daily calorie intake. According to an article by Erin Coleman, “adults should consume 45 to 65 percent of their calorie intake as carbohydrates, and at least 130 grams of carbs per day” (Coleman, 2012). According to Coleman, in order to determine the grams of carbs a person needs daily, “calculate 45 to 65 percent of your total calorie intake, and dividing by 4” (Coleman, 2012). J.W’s CHO needs is as follows:

FORMULA:

$$\text{CHO} = 2,269.5 \times 0.45 \text{ divided by } 4 \text{ calories/gram} = 255 \text{ grams}$$

$$\text{CHO} = 2,269.5 \times 0.65 \text{ divided by } 4 \text{ calories/gram} = 369 \text{ grams}$$

J.W’s CHO intake should be between 255-369 grams per day.

For the most part, J.W lives a sedentary lifestyle. He isn’t very active and travels three days in the week. According to Dudek, an individual is to consume at least 0.8g/kg of protein daily. J.W’s PRO needs is a follows:

FORMULA

$$\text{PRO} = 0.8 \times (\text{weight in kilograms})$$

CALCULATIONS:

$$\text{PRO: } 0.8 \times 109.09 = 87$$

J.W’s PRO intake should be 87g per day.

Fat is also an essential part of our diets, but it is important to consume healthy fats. According to Coleman, “To calculate your daily fat grams, multiply the number of calories you

consume daily by 20 and 35 percent divided by 9” (Coleman, 2012). J.W’s recommended fat intake is calculated below:

$$\text{Fat} = 2,269.5 \times 0.20 \text{ divided by } 9 \text{ calories/gram} = 50.4\text{g}$$

$$\text{Fat} = 2,269.5 \times 0.35 \text{ divided by } 9 \text{ calories/gram} = 88.2\text{g}$$

J.W’s recommended daily fat intake should be between 50.4-88.2 grams.

Part III PATIENT EDUCATION: Criteria 2

Currently, J.W consumes a high calorie, high fat and high carb diet and consumes foods that lack in nutrients. He eats out for three meals a day and for the most part consumes fast foods because he travels three days out of the week and is always on the go. If J.W continues with his current diet and keeps with his sedentary lifestyle, he puts himself at a higher risk for cardiovascular disease since he already is diagnosed with hypertension and type II diabetes.

One of the diets that I recommend that for J.W to follow is the DASH diet. According to the actual website of the dash diet, DASH has been proven to lower blood pressure and cholesterol, and is associated with lower risk of several types of cancer, heart disease, stroke, heart failure, kidney stones, reduced risk of developing diabetes, can slow the progression of kidney disease, and now is associated with reduced risk of depression” (DASH diet, n.d). The DASH diet consists of fruits and vegetables, lean meats such as fish and poultry, whole grains and healthy fats that are good for the heart.

In order for J.W to improve his quality of life, I recommend that he works out 5 days out of the week for at least 30 minutes. I recommend that he starts off with moderate exercise and possibly work his way up to more vigorous exercises or to workout moderately for a longer period of time. Aside from working out, a big part of weightloss is nutrition. I recommend that J.W limits the amount of times he goes out to eat. I suggest that J.W starts cooking more at home

so that he knows exactly what is going into his body. This way, he can also limit the amount of salt he puts in his food. If J.W begins the DASH diet and incorporates exercise into his daily routine, he will achieve his goal of losing a pound a week and most importantly, he will improve his quality of life and become a healthier individual.

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