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The Nutrition Care Process Related to Hypertension

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Introduction

Hypertension is a serious and common condition that is prevalent in both developing and economically stable countries (Vogt et al., 1999). It increases a patient's risk for cardiovascular disease including myocardial infarction, stoke, and end stage renal disease (Vogt et al., 1999). The use of medical nutrition therapy to treat hypertension focuses on specific life-style changes that have been proven to reduce blood pressure leading to a decrease in mortality and morbidity. This paper describes the importance of medical nutrition therapy in the reduction and treatment of hypertension and demonstrates the nutrition care process for hypertension using a case study patient.

Hypertension

Hypertension is the chronic elevation of blood pressure. Blood pressure is measured in terms of systolic pressure and diastolic pressure. According to the American Heart Association [AHA] (2020), systolic blood pressure is the pressure the heart exerts against the arterial wall when the heart beats. Diastolic blood pressure is the pressure the heart exerts against the arterial wall when the heart is resting (AHA, 2020). When reading a blood pressure measurement, systolic pressure is the first and often larger number followed by the diastolic pressure (AHA, 2020). For example, a blood pressure reading of 120/80 indicates a systolic pressure of 120 and a diastolic pressure of 80.

In a clinical setting hypertension is organized into four levels, normal, elevated, stage 1 and stage 2 (American College of Cardiology, 2017). Below, table1 indicates the blood pressure measurements for each stage.

Table 1

Hypertension Levels	**Systolic Pressure (mm of Hg)**		**Diastolic pressure (mm of Hg)**
Normal	<120	And	<80
Elevated	120-129	And	>80
Stage 1	130-139	Or	80-89
Stage 2	≥140	And/ Or	≥90

There are two separate types of hypertension, primary, also known as essential, and secondary. Primary hypertension has no known causes (Nelms & Sucher, 2016). Secondary hypertension, however, is caused from other disorders such as kidney disease, heart disease, and disorders of the endocrine system (Mayo Clinic, 2020). Primary hypertension is the most common type of hypertension and is usually related to lifestyle factors such as high sodium intake, low potassium intake, obesity, low activity levels, and/or genetics (Nelms & Sucher, 2016). Additionally, there is a possibility for hypertension to respond poorly to medications which is known as resistant hypertension. Resistant hypertension is defined as stage 2 (>140/90 mmHg) hypertension that is not normalized even after treatment with three to four antihypertensive medications (Sheppard, et al., 2017). The treatment for resistant hypertension typically includes the addition of four or more medications to normalize blood pressure (Sheppard, et al., 2017). The treatment goals for hypertension are to reduce blood pressure and reduce patient's risk for the common comorbidities associated with hypertension through pharmacologic interventions and medical nutrition therapy (Nelms & Sucher, 2016).

Pathophysiology

Introduction

Elevated blood pressure is the result of an increase in cardiac output or an increase in peripheral vascular resistance or a combination of the two (Mayet & Hughes, 2003). Blood pressure regulation is controlled by several systems within the body including the autonomic and sympathetic nervous systems, the renin-angiotensin system, and the endocrine system. Defects from any one of these systems can lead to an increase in systemic vascular resistance and/or an increase in cardiac output leading to an increase in blood pressure (Beevers, et al, 2001). Additionally, research found an increase in blood pressure can be caused by insulin resistance, obesity, and high salt intake (Beevers, et al, 2001). The pathophysiology of hypertension greatly differs patient to patient. The following will review basic information regarding the pathophysiology of hypertension related to the autonomic nervous system, endocrine system, and the renin-angiotensin system.

Autonomic nervous system

Within the autonomic nervous system, the two branches of the system, parasympathetic and sympathetic, work together to regulate blood pressure. When stimulated, the sympathetic nervous system increases blood pressure using the neurotransmitters norepinephrine and epinephrine (Grassi & Mancia, 2014). The parasympathetic nervous system regulates the increase of blood pressure through neurotransmitter acetylcholine which slows down the heart rate. Hypertension has been shown to be related to an impairment of the parasympathetic system and an overdrive of the sympathetic system, which causes an increase on norepinephrine (Grassi, 2015).

Endocrine system

Although epinephrine and norepinephrine are controlled by the autonomic nervous system, they are released by the adrenal glands, part of the endocrine system. Endocrine

disorders that result in an excessive release of epinephrine and norepinephrine can result in hypertension (Nelms & Sucher, 2016). Furthermore, it has been found that patients with hypertension have an increased sensitivity and release of norepinephrine (Mayet & Hughes, 2003; Foex & Sear 2004).

Renin-angiotensin system

The renin-angiotensin system regulates blood pressure through the release of many different hormones. Renin is released from the granular cell in the kidney in response to sympathetic stimulation, reduced sodium-chloride and a decrease in blood flow to the kidney. Renin is used to convert angiotensin to angiotensin I which is then converted to angiotensin-converting enzyme (ACE) (Nelms & Sucher, 2016). ACE indirectly causes vasoconstriction through the breakdown of bradykinin, which is a vasodilator and ACE converts angiotensin I into angiotensin II (Beevers, 2001). Angiotensin II is a vasoconstrictor and will cause a rise in blood pressure (Beevers, 2001). Angiotensin II triggers aldosterone to be release from the adrenal cortex (Nelms & Sucher, 2016). The release of aldosterone also causes a rise in blood pressure by influencing the kidney to retain sodium which will increases blood volume (Nelms & Sucher, 2016).

The renin-angiotensin system works in a negative feedback loop (Foex & Sear, 2004). When the renin-angiotensin system is operating correctly, high salt intake will cause a decrease in angiotensin II, thus decreasing the need for sodium retention (Drenjančević-Perić et al., 2011). In 40-50% of patients with primary hypertension, the mechanisms in which angiotensin II is controlled does not react to an increase in sodium intake (Drenjančević-Perić et al., 2011). In some incidences of hypertension, this phenomenon is caused by a salt sensitivity. In patients with a salt sensitivity, changes in blood pressure has a positive correlation with salt intake. For

example, an increase in salt intake raises blood pressure and a decrease in salt lowers blood pressure (Drenjančević-Perić et al., 2011). Salt sensitivities are common in individuals with renal disease, diabetes, obesity, hypertension, and old age (Drenjančević-Perić et al., 2011).

Symptoms

Hypertension typically does not present with symptoms, however, the symptoms can occur in some patients, such as shortness of breath, nose bleeds, and headaches (Mayo Clinic, 2020). However, even though high blood pressure does not cause any specific symptoms, uncontrolled hypertension can lead to many health risks such as heart attacks and strokes (Mayo Clinic, 2020). Fortunately, because checking a patient's blood pressure is part of routine assessments, hypertension can be easily caught by physicians (Mayo Clinic, 2020).

Etiology

Hypertension is associated with many risk factors that are both controllable and fixed. A few examples of controllable risks factors are smoking, poor diet, inactivity, obesity, diabetes mellitus and hyperlipidemia, and a few examples of fixed risk factors are chronic kidney disease, family history, and increased age (Whelton et al., 2018). The prevalence of hypertension increases from 6.8% to 11% in 20 to 34-year-olds, and to 78% in populations 75 years and older (Nelms, M., Sucher, K., 2016). Additional fixed risk factors include, gender, low socioeconomic status, obstructive sleep apnea, and psychosocial stress (Whelton et al., 2018). Diabetes is also a very common risk factor for hypertension. Seventy-one percent of adults in the Unites States who have been diagnosed with diabetes also are diagnosed with hypertension (Whelton et al., 2018). Hypertension is also related to the overactivation of the renin-angiotensin-aldosterone system (Whelton et al., 2018). Race is also a risk factor for hypertension where black populations have the highest prevalence at 40.3% for men and 42.9% for females (Nelms, M., Sucher, K.,

2016) The second highest prevalence of hypertension is within the white population at 30.4% for men and 27.6% for females (Nelms, M., Sucher, K., 2016).

Epidemiology:

Hypertension is also known as the silent killer. This is because it often has no symptoms and goes is under diagnosed. According to the Center for Disease Control (2020), half of all adults in the United States have hypertension, however, only 1 in 4 of those adults have their hypertension under control. In 2018, hypertension was associated with approximately 500,000 deaths. (Center for Disease Control, 2020). Additionally, there is an estimated cost of $46 billion in health care cost in 2009, both directly and indirectly related to hypertension (Nelms, M., Sucher, K., 2016).

Nutrition Care Process

The nutrition care process includes, nutrition assessment, nutrition diagnosis, nutrition intervention, and nutrition monitoring and evaluation (Nelms & Sucher, 2016). The nutrition care process related to hypertension includes medical nutrition therapy interventions related to lifestyle modifications (Nelms & Sucher, 2016). According to the Evidence Analysis Library for the Academy of Nutrition and Dietetics, the current nutrition practice guidelines for the management of hypertension focus on medical nutrition therapy (MNT), vitamin D, potassium, calcium, magnesium, sodium, the Dietary Approaches to Stop Hypertension (DASH) dietary pattern, alcohol, and physical activity (Lennon, et al., 2017).

The DASH diet is high in fruits, vegetables, and whole grains, while limiting fats intake and high in potassium, calcium, magnesium, and fiber (AND, 2020). To provide additional benefits it is recommended to limit sodium levels to between 1,500-2,400 mg per day in patient with hypertension (AND, 2020). Research has shown that when compared to the typical American

diet, following the DASH diet can decrease systolic blood pressure by 5-6 mmHg and diastolic blood pressure by 3 mmHg (Lennon et al., 2017). Patients with hypertension are recommended to meet the dietary reference intake (DRI) for calcium, magnesium, potassium, and vitamin D. In patients who are not able to meet the DRIs for these nutrients, supplementation has been found to improve blood pressure (Lennon et al, 2017). Weight loss is usually another important aspect to the treatment of hypertension. Counseling patients on a calorie-controlled DASH diet has been shown to reduce systolic blood pressure by 2 to 11 mmHg and diastolic blood pressure by 0 to 9 mmHg. Additionally, engaging in 150-300 minutes of moderate to vigorous physical activity can lower systolic pressure 4-9 mmHg (Nelms & Sucher, 2016). However, even increasing physical activity to at least 30 minutes per day is shown to have a positive impact on lowering blood pressure (Nelms & Sucher, 2016). Smoking cessation is considered the most important lifestyle change an individual can do to reduce the risk of hypertension (Nelms & Sucher, 2016).

Nutrition Assessment

A nutrition assessment is an important part of the nutrition care process. Information gathered during a nutrition assessment by a registered dietitian nutritionist (RDN) sets the foundation for the rest of the nutrition care process (Nelms & Sucher, 2016). A nutrition assessment aids the RDN in identifying nutrition related problems, creating a nutrition intervention, and successfully monitoring and evaluating the patient's progress (Nelms & Sucher, 2016). During the assessment, the RDN focuses on dietary factors and patterns that are commonly associated with hypertension (Nelms, M., Sucher, K., 2016). The following nutrition assessment was conducted on patient X, including patient history, anthropometric data, biochemical data, nutrition focused physical exam, and food and nutrient related history.

Patient History

Patient history includes both the patient's medical history and social history. Social factors such as socioeconomic status, education level, support systems, lifestyle, knowledge, and beliefs and attitudes are important to gather during a nutrition assessment (Nelms, M., Sucher, K., 2016). RDNs must consider social factors when planning and implementing a nutrition intervention. These factors play a large role in nutrition status and can affect the patient's compliance with a nutrition intervention (Nelms, M., Sucher, K., 2016). Additionally, when assessing a patient with hypertension, it is important to identify any comorbidities. Comorbidities such as obesity, diabetes, dyslipidemia, and renal failure are common in patients with hypertension and can impact the personalized nutrition intervention (Nelms & Sucher, 2016). When gathering the patients past medical history, the RDN should also enquire a list of the patient's current medications. Medications are often used with lifestyle modifications to control hypertension and they many antihypertensive medications have possible food drug interactions (Nelms & Sucher, 2016).

Patient X is a 52-year-old male who was diagnosed with hypertension when he was 13 years old. The patient's family history includes a mom and sister with hypertension, indicating a potential genetic factor relating to his hypertension. The patient has a history of obesity, and type II diabetes. He is married with five children. Currently the patient is getting around six hours of sleep at night and has no history of sleep apnea. Patient X has worked at a high stress job for 25 years. Recently the patient has gotten a new job which he has described as more stressful than his previous one, indicating that chronic stress could also contribute to the patient's hypertension. His job also includes traveling to various places across the United States, but over the past 25 years has been able to decrease the amount of time he is traveling. Currently, the patient travels

about twice a month for periods ranging from three to five days a week. This lifestyle is significant when planning and implementing a nutrition intervention. Large amounts of traveling indicate that the patient must eat out or eat in a hotel room frequently. A nutrition intervention should be modified to work with the patient's lifestyle. Patient X does not smoke or use smokeless tobacco. He currently takes medication to control his hypertension and diabetes. A current list of the patient's medications includes, low does Aspirin, Losartan Potassium, Glipizide, Metformin HCL ER, and Simvastatin. Patient's taking Losartan Potassium may have increased serum potassium levels and should avoid salt substitutes (Nelms & Sucher, 2016). Patient X states that being diagnosed with hypertension has had a limited impact on his life, besides having to take additional medication. This is very common in patients with hypertension; therefore, hypertension is often referred to as the silent killer.

Anthropometric data

Anthropometrics data is imperative to any nutrition assessment and includes weight, height, body mass index, percent usual body weight, and recent weight changes (Nelms & Sucher, 2016). Anthropometric data helps RDNs identify clients who are nutritionally at risk (Nelms & Sucher, 2016). It is common for patients diagnosed with hypertension to be overweight or obese. When hypertension is present in such patients, additional increased weight will also cause an increase in blood pressure (US Department of Health and Human Services, 2003). Weight loss is advised for patients with hypertension who are obese, meaning a BMI of 30 or greater or patients who are overweight, meaning a BMI of 25-29, if they have two or more risk factors for heart disease (US Department of Health and Human Services, 2003). Weight loss can reduce systolic blood pressure by 5 to 20 mmHg per ten kilograms of body weight (Nelms & Sucher, 2016). Thus, even a small reduction in weight can have a large impact on managing

hypertension. When assessing a patient who has hypertension anthropometric data aids the RDN in assessing if a patient is overweight or obese.

Patient X is currently 6'1" and weighs 263 pounds. He is obese indicated by a BMI of 35 and a waist circumference of 42 inches. It is important to note that patient X has a large muscle tone especially in his legs and arms and in the past few years, patient X has had a planned weight loss of 95 pounds totaling a 26% weight change. The patient reported this weight change did not impact his blood pressure. The accuracy of this statement is questioned and additional information such as past blood pressure measurements. Patient X has an ideal body weight of 184 pounds, which means an additional weight loss may aid patient X in getting his blood pressure under control.

Biochemical data

Biochemical lab results are used by the RDN to determine nutritional markers and organ function (Nelms & Sucher, 2016). An RDN should carefully evaluate biochemical lab values because many different factors influence nutritional markers. Nutritional markers and organ function can be influenced by food and fluid intake, certain medications, diseases, and organ malfunction (Nelms & Sucher, 2016). It can be determined by many different tests including, but not limited to, samples of blood, urine, feces, and tissues (Nelms & Sucher, 2016). Biochemical data is used in assessments for patients with hypertension to indicate causes that are contributing to the patient's hypertension and to monitor organ function (AHA, 2017). Additionally, patients with hypertension have an increased risk to various comorbidities such as cardiovascular disease, chronic kidney disease, and diabetes (Mayo Clinic, 2020). Due to this increased risk, biochemical lab values that may indicate additional high-risk comorbidities are standard during an assessment for hypertension.

For a patient with hypertension, the primary measurement that should be assessed by the RDN is the patient's blood pressure. This indicates to the RDN the severity of the patient's hypertension. Additional biochemical labs that should be assessed are lab values that indicate diabetes, such as hemoglobin A1C and blood glucose levels (AHA, 2017). A fasting glucose greater than 126mg/dL and a hemoglobin A1C greater than 6.5% indicate the presence of diabetes (Nelms & Sucher, 2016). Abnormalities of lipid serum panel indicate increased risk for cardiovascular disease (Nelms & Sucher, 2016). Optimal lipid serum levels include total cholesterol less than 199mg/dL, HDL cholesterol levels between 40mg/dL and 59mg/dL, LDL cholesterol levels less then 100mg/dL for individuals at high risk for heart disease, and triglyceride levels less than 150mg/dL (Nelms & Sucher, 2016). Thyroid-stimulating hormone (TSH) is another basic test for patients with hypertension because hyperthyroidism and hypothyroidism can cause hypertension (AHA, 2017). Normal lab values for TSH range between 0.5 to 5.0 mlU/L. Biochemical lab values related to liver and kidney function tests are standard for patients with cardiovascular diseases (Academy of Nutrition and Dietetics [AND], 2020). These tests include blood urea nitrogen (8-18mg/dL), creatinine (0.6-1.2 mg/dL), and glomerular filtration rate (135-200L/day) (Nelms & Sucher, 2016). Additionally, serum electrolyte lab values such as serum sodium (136-145mEq/L) and potassium (3.5-5.5mEq/L) should be included in a biochemical assessment for patients with hypertension (AND, 2020). Abnormal values for both serum potassium and serum sodium are not always indicators of inadequate or excessive intake. These values are also used to assess kidney function, hydration status, electrolyte imbalances and acid-base imbalances (Nelms & Sucher, 2016).

The last time patient X checked his blood pressure it was measured at 122/86. This is an indication that even though the patient is on medications to help control his hypertension, he still

is at stage 1 of hypertension. Patient X's last hemoglobin A1C level was 7.9%. This raises a concern that the patient is not in control of his diabetes and additional diabetes education should be considered as part of his treatment plan. Other biochemical data that should be assessed are the patient's lipid profile, electrolytes such as sodium and potassium, and labs related to kidney and liver function.

Nutrition focused physical finding

A nutrition focused physical exam is completed by an RDN to assess the patient for signs of malnutrition and nutrient deficiencies (Nelms & Sucher, 2016). When a RDN completes a nutrition focused physical exam, they look for signs of muscle wasting and subcutaneous fat loss (Nelms & Sucher, 2016). Additionally, during a nutrition focused physical exam, an RDN will assess a patient's hair, nails, skin and eyes for signs of nutrient deficiencies and the presence of any edema (Nelms & Sucher, 2016). The RDN should assess the patient for abdominal obesity as abdominal obesity increases the risk for diabetes, metabolic syndrome, and other cardiovascular diseases (Nelms & Sucher, 2016). Abdominal obesity can be assessed by using waist circumference, which for men is equal to or greater than 40 inches for men, while 35 inches for women is associated with obesity and chronic disease (Nelms & Sucher, 2016). Another important finding during a nutrition focused physical exam is any odor related to cigarette smoke and/or alcohol (AND, 2020). These are indications that the patient has consumed these substances recently. Regarding patient X, no signs of muscle wasting, or subcutaneous fat loss were found. Skin, nails, hair, and eyes appeared to be within normal limits and there were no signs of edema present.

Food and nutrition intake

During an assessment, an RDN, gathers information related to the patient's food and fluid intake, as well as physical activity (Nelms & Sucher, 2016). For patients with hypertension, the RDN should gather a food history (AND, 2020). Food histories can be gathered through a few different methods including a 24-hr recall, food frequency questionnaire, and/or a food diary (Nelms & Sucher, 2016). Each method of gathering information has its advantages and disadvantages and the RDN should choose the method that is the best fit for the patient. When gathering a food history from a patient with hypertension, the RDN should pay attention to several factors that could impact the patient's hypertension or risk for comorbidities. This includes fat and cholesterol intake, mineral intake such as sodium, potassium, calcium and magnesium, fiber, sterols and stanols, and omega 3-fatty acids (AND, 2020). The RDN should also ask the patient specific questions, such as how often they eat fruits and vegetables, whole grains, and legumes, and if the patient has any food allergies or intolerances (AND, 2020). Additionally, the RDN should gather information on lifestyle factors that may influence food intake such as the frequency of meals, snacks, and desserts, any recent changes in meal patterns or intake, how they are preparing their meals, where they are eating, and if they have ever tried any diets in the past (AND, 2020). The RDN should also gather information on the patient's current physical activity (AND, 2020).

Patient X stated that he tries to eat as healthy as he can. He does not add extra salt into his meals, however, does have a sweet tooth. For a few months, the patient was trying to follow the keto diet program by Sanford Profile, however, the last few weeks he has not been following it as closely. The patient currently eats around three meals per day and has one to three snacks a day. The patient eats out approximately twice a week and more often when he is traveling. His typical breakfast is a protein shake, protein bar, and coffee with cream and sugar. His typical

lunch consists of a salad with chicken or a protein shake. For dinner patient X usually eats whatever his wife makes. These meals are usually spaghetti, tacos, or stir fry. The patient typically eats something sweet after dinner and an evening snack. The patient usually has one glass of whiskey a week. He claims to drink around a gallon of water every day and keeps a water bottle at his desk while he works. When interviewing the patient, he reported that in the last week he ate at In-N-Out Burger, 5 Guys, and had Chinese food twice. At this time, the patient was traveling and due to the current COVID-19 pandemic he had to eat at fast food restaurants as opposed to normally dining in at restaurants while traveling. The patient is currently exercising twice a week, however, tries to exercise for closer to 3 to 4 times per week, for approximately 40 minutes to an hour-long increment. He enjoys bike rides but also runs on occasion.

Comparative standards

Using the Mifflin St. Jeor equations with an activity factor of 1.3 the patient's current estimate energy needs are 2700kcal per day (AND, 2020). Using 0.8 grams of protein per kg of ideal body weight the patient's protein needs are 70 grams of protein per day and current fluid needs are 2700 mL per day (AND, 2020). For a patient with hypertension, the comparative standards for the DASH diet include less than 7% of daily fat intake from saturated fat and less than 2300 mg of sodium per day (Nelms & Sucher, 2016). Additionally, the daily recommended intakes (DRIs) for potassium, calcium and magnesium are recommended for patients with hypertension (Nelms & Sucher, 2016).

Nutrition Diagnosis

Nutrition diagnosis is independent of the medical diagnosis. It identifies the nutrition related problem that the RDN will treat through nutrition interventions (Nelms & Sucher, 2016).

Specific nutrition diagnosis related to hypertension include excessive oral intake (NI-2.2), excessive mineral intake (sodium) (NI-5.10.7), overweight/obesity (NC-3.3), physical inactivity (NB-2.1), food and nutrition related knowledge deficit (NB-1.1) (AND, 2020). Three possible PES statements include:

1. (NI-2.2) Excessive oral intake related to loss of appetite awareness, as evidence by estimated intake that exceeds estimated energy needs.
2. (NC-3.3) obesity related to excessive oral intake as evidence by a waist circumference more than normative for age and sex.
3. (NI-5.10.7) Excessive sodium intake related to a food and nutrition related knowledge deficit concerning food sources of sodium as evidence by an estimated intake containing high amounts of sodium compared to the recommended daily allowance.

Due to the information Patient X provided during the assessment, an appropriate PES statement for Patient X would be (NI-5.10.7) excessive sodium intake related to a food and nutrition related knowledge deficit concerning food sources of sodium as evidence by an estimated intake containing high amounts of sodium compared to the recommended daily allowance.

Nutrition Intervention

Nutrition intervention is the stage in the nutrition care process where the RDN plans to treat the patient's most pressing nutrition related problem (Nelms & Sucher, 2016). The RDN must work with the patient, as well as other health care professionals, the patient's family, or caregiver to create the best realistic treatment plan for the patient and to implement that plan into action (Nelms & Sucher, 2016). The four domains of the nutrition care process are food and nutrient delivery, nutrition education, nutrition counseling and coordination of care with other

health care professionals (Nelms & Sucher, 2016). Nutrition interventions for patients with hypertension typically focus on nutrition education, nutrition counseling and coordination of care. Nutrition education is used to teach patients about ways they can reduce their hypertension through diet and exercise (AND, 2020). Nutrition counseling is used to collaborate with the patient to establish goals, then implement a plan that will help the patient achieve these goals in a way that works for the patient (AND, 2020). Coordination of care with a mental health professional for stress maintenance or smoking cession may also be an important part of an intervention plan. Nutrition interventions for patients with hypertension should be targeted at initiating a diet, such as the DASH diet that emphasize:

- A high intake of vegetables, fruits, and whole grains.
- Incorporating low fat dairy items, poultry, fish, legumes, vegetable oils and nuts into meals.
- Limiting intake of red meats, sodium, and sweets.

Additionally, nutrition interventions should include weekly physical activity goals and maintenance of a healthy weight (AND, 2020).

The current recommendation for patients with hypertension is to follow the DASH diet while limiting sodium intake to 1,500-2400mg per day (AND, 2020). An intervention plan for Patient X should include education on the DASH diet with a sodium restriction of less than 2,300mg per day (Lennon, et al, 2017). Additionally, diet education about healthy eating while traveling should be provided to the patient. Nutrition counseling should be used to collaborate with Patient X to create individualized goals and a plan on how the patient will meet these goals.

Monitoring and Evaluation

Monitoring and evaluating the patient's progress is an important part of the nutrition care process. After the initial assessment, three follow-up appointments should be scheduled with the patient every other week, and then once a month for the first year (Lennon, et al, 2017). After the first year, appointments should be made 2-3 times per year (Lennon, et al, 2017). The RDN will monitor the patients progress and evaluate the success of the nutrition intervention at these appointments by evaluating the patient's weight, blood pressure and food intake through a 24-hour recall. The RDN may provide additional medical nutrition therapy techniques such as motivational interviewing, additional nutrition education or adjustments to the patient's nutrition intervention plan if progress is not being shown.

Conclusion/Prevention

Hypertension is a very prevalent condition around the world. Diet and lifestyle changes can greatly reduce a patient's blood pressure, as well as reduce the risk of further health complications associated with hypertension. Additionally, similar diet and lifestyle modifications can be used to prevent hypertension. These include eating a diet high in fruit, vegetables and whole grains and low in sodium and fat; maintaining a healthy weight; getting at least 2 hours and 30 minutes of physical activity per week; limiting alcohol intake and getting enough sleep (Center for Disease Control, 2020). The nutrition care process in important for the treatment of hypertension. A nutrition intervention can reduce the patient's blood pressure, leading to decrease in the health risks associated with hypertension. A successful intervention can improve patient quality of life as well as decrease the risk for mortality and morbidity.

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