Improving Self-Management in Patients with Uncontrolled Blood Pressure

Brittany E. Hines

College of Nursing, East Carolina University

Doctor of Nursing Practice Program

Dr. Dianne Marshburn

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Abstract

Hypertension is one of the top contributors to the risk of death worldwide. Per the Centers for Disease Control (CDC, 2022a), every year, 795,000 people in the United States have a stroke, and it is the leading cause of heart disease, contributing to approximately 20% of healthcare costs. The lack of understanding of blood pressure and necessary lifestyle and diet changes contributes to uncontrolled blood pressure becoming out of control. Education provided by the healthcare provider (HCP) at the patient's visit is necessary for rural healthcare settings to increase knowledge of uncontrolled blood pressure among a diverse patient population (Cote et al., 2021). Reducing patients diagnosed with uncontrolled blood pressure can reduce costs for patients, organizations, and the health care system. This project aimed to implement educational tools such as a self-management guide, activity log, diet plan, and water diary for patients with uncontrolled blood pressure. The project positively impacted patients that had a diagnosis of uncontrolled blood pressure. There was a 50% increase in patient reporting of compliance in self management of health resulting in improved hypertension goals which ultimately reduced complications of uncontrolled blood pressure such as myocardial infarction, stroke, and chronic renal failure.

Keywords: uncontrolled blood pressure, health literacy, self-management, hypertension, patient education.

Table of Contents

Abstract ……...……....2

Section I: Introduction ..……..5

Background……..…5

Organizational Needs Statement……..…5

Problem Statement……..….8

Purpose Statement……8

Section II: Evidence……..….10

Literature Review……...…10

Evidence-Based Practice Framework……...….14

Ethical Consideration and Protection of Human Subjects…….15

Section III: Project Design…….……17

Project Site and Population……..……..17

Project Team……..18

Project Goals and Outcomes Measures……...…19

Implementation Plan……..… 21

Timeline…….22

Section IV: Results and Findings……...……23

Results……...…….23

Discussion of Major Findings……23

Section V: Interpretation and Implications……25

Costs and Resource Management……..……25

Implications of the Findings……..……26

Sustainability……28

Dissemination Plan……28

Section VI: Conclusion……30

Limitations and Facilitators……30

Recommendations for Others……30

Recommendations for Further Study……31

Final Thoughts……32

References……33

Appendices ……37

Appendix A: Literature Search……37

Appendix B: Pre-Survey……39

Appendix C: Self-Management Guide……40

Appendix D: Dietary Approach to Stop Hypertension (DASH) Diet……43

Appendix E: Activity Log……51

Appendix F: Weight Log……52

Appendix G: Water Diary……53

Appendix H: Post-Survey……54

Appendix I: Project Tracking Tool……55

Appendix J: Project Timeline……57

Appendix K: Project Budget……58

Appendix L: Patient Demographics……59

Appendix M: Patient Outcomes……60

Appendix N: Project Poster……61

Section I. Introduction

Background

Primary care providers are responsible for providing care to patients and managing their health, focusing on education, preventative measures, and forming long-term relationships with them and their support system to promote and encourage healthier lifestyles and better health outcomes. Hypertension, also known as high blood pressure, is one of the top contributors to the risk of death worldwide. Per the Centers for Disease Control (CDC, 2022a), every year, 795,000 people in the United States have a stroke, and it is the leading cause of heart disease, contributing to approximately 20% of healthcare costs. The lack of understanding of blood pressure and necessary lifestyle and diet changes contributes to uncontrolled blood pressure becoming out of control. Education provided by the healthcare provider (HCP) at the patient's visit is necessary for rural healthcare settings to increase knowledge of uncontrolled blood pressure among a diverse patient population (Cote et al., 2021). In 2019, there were 17.9 physicians for every 10,000 residents in North Carolina (NCDC, 2021). In 2017, there were 6.47 nurse practitioners for every 10,000 residents in North Carolina (Spero & Galloway 2019,).

Organizational Needs Statement

The organization is held accountable by governing bodies such as Accountable Care Organizations (ACOs) and the Center for Medicare and Medicaid Services (CMS) to identify patients with uncontrolled blood pressure and collaboratively reach a mutual goal of having a blood pressure of less than 140/90. Controlling blood pressure improves the quality of patient care by decreasing comorbidities, including stroke, heart attack, kidney impairment, and mortality. Controlling blood pressure also helps reduce overall healthcare costs (Du et al., 2018). Uncontrolled blood pressure costs an average of $131-198 billion each year, including healthcare

visits, prescriptions, and loss of productivity due to premature mortality (Centers for Disease Control [CDC], 2022a).

This project evaluated the relationship between patient involvement and understanding of self-management to promote lifestyle and diet changes as it relates to controlling blood pressure that is considered uncontrolled (greater than 140/90). The project partner was a rural, non-profit family practice clinic in eastern North Carolina (NC). The project site was part of a more extensive university network. The mission statements state, "to be a physician network that fosters outstanding patient-centered community-based care by operating practices where physicians are valued and supported, and patients have access to the full range of an integrated health care system. To be an integral part of a premier health care system that strives to improve the health of North Carolina communities with proven and innovative services, harnessing the resources of the [redacted] system." ([redacted], 2022, Our Mission section).

Healthy People 2030 partnered with the United States Preventive Services Task Force (USPSTF) and recommended screening for hypertension in adults 18 years and older at each office visit. Hypertension is one of the most diagnosed chronic illnesses in the US. Approximately 45% of adults have hypertension, one of the most diagnosed conditions in primary care. Screening patients with office blood pressure measurements and early treatment of hypertension can significantly reduce the incidence of complications and cardiovascular events. Risk factors that may increase an individual's risk of uncontrolled hypertension include age, race, family history, obesity, and poor lifestyle habits, including lack of exercise, diet, smoking, and alcohol abuse. There is a higher incidence of uncontrolled hypertension in African Americans. Early treatments, including lifestyle changes, medications, and exercise, can help prevent stroke,

heart failure, and coronary heart diseases. Treatment is decided based on the severity of the condition, age, and other risk factors (USPSTF, 2021).

A community health needs assessment was conducted in 2019 for the residents of this rural eastern NC county. The assessment identified that hypertension is higher in Nash County than in the rest of the state and the US for patients. Medicare recipients make up a large number of those diagnosed. Approximately 66.5% of Medicare recipients, 58% in North Carolina and 55% in the United States, are diagnosed with hypertension. Residents of Nash County are found to be older than that of North Carolina and have the highest percentage of residents who are between the ages of 45-54 (14%), followed by ages 35-44 (11.7%) and 65 years and older (17.5%). Approximately 17.4% of Nash County residents are low-income or at the poverty level; 15% are 65 and older; 3.1% high school dropout rate as of 2016-2017. High school dropouts have shown that they are typically less healthy, require more medical care, and have a higher risk of incarceration, which directly influences a community's economic, social, and civic health (Nash County Community Health Assessment, 2019).

The county serves low-income, underserved patients who suffer from diagnoses such as uncontrolled blood pressure exacerbated due to a lack of knowledge or low health literacy. Twelve percent of Nash County residents, ages 25-44, do not have a high school degree (MyFutureNC, 2022). A meeting with the Director of Operations revealed a need for better blood pressure control related to patient understanding and compliance. The poor management impacts patient comorbidities, increasing costs to both the site and the patients, time spent at office visits, and increased risk of polypharmacy ([redacted] personal communication, July 8, 2022).

This project focused on implementing educational materials provided to patients to help them better understand self-management of uncontrolled blood pressure and the lifestyle and diet

changes required to accomplish better blood pressure control. The project developed a new program using educational materials, including verbal scripting for patients with uncontrolled blood pressure and a current office reading of >140/90. The project aligns with the Institute for Healthcare Improvement's (IHI) Triple Aim by improving patient quality and satisfaction, improving the health of Nash County's residents, and reducing healthcare costs to both the patient and the organization (IHI, 2022).

Problem Statement

The project aimed to increase self-management in patients with uncontrolled blood pressure by providing educational materials and having a two-way verbal discussion about lifestyle changes at their primary care office visits. A provider provided these materials that were easy to understand to assist the patient in tracking their blood pressure at home, low salt diet, and suggested lifestyle changes at the patient's office visit, such as increased water intake, weight loss, and increased activity. The goal was to improve the patient's understanding and compliance in self-management of their blood pressure at home.

Purpose Statement

Reducing patients with uncontrolled blood pressure can reduce costs for patients, organizations, and the health care system. This project aimed to implement educational tools for patients with uncontrolled blood pressure and provider-patient collaboration to improve self-management and control of blood pressure. The providers offered educational materials to enhance patients' understanding of blood pressure management. The patients provided their current knowledge of uncontrolled blood pressure using a pre-survey at their initial visit. This included a self-stated personal lifestyle goal to achieve by their next visit. A post-survey was completed at the follow-up visit and evaluated if the patient achieved their goal. The

comprehensive handouts provided to the patients included a pre-survey, Self-Management Guide including a blood pressure diary, Dietary Approaches to Stop Hypertension (DASH) diet information, an activity log, a weight log, and a water diary.

Section II. Evidence

Literature Review

A literature review was completed to determine education and promotion of self-management of uncontrolled blood pressure. Google Scholar and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) were searched using the phrases "health literacy," "uncontrolled blood pressure," "ACO measures for uncontrolled blood pressure," "lifestyle changes," "diet," "self-management" and "Healthy People uncontrolled blood pressure." See Appendix A for a detailed table of the literature search for this project. The search results were limited to information published in English and full text within the last five years. The literature review provided information on health literacy and its relationship to uncontrolled blood pressure. Articles that were inconclusive to the relationship between health literacy, self-management, and uncontrolled blood pressure or did not relate to the United States population were excluded. All selected articles were evaluated for the type and level of evidence according to the John Hopkins *Hierarchy of Evidence Guide* (2022). The articles range from the quasi-experimental study (Level II), non-randomized prospective cohort trial (Level IV), integrative review (Level V), non-randomized prospective control trial (Level VI), and opinion of authorities (Level VII). Each article was evaluated for credibility using set inclusion and exclusion, including if pertinent to the project. Seventeen references were utilized in this literature review.

Current State of Knowledge

The literature does acknowledge that uncontrolled blood pressure can be controlled by lifestyle modifications such as increasing exercise, maintaining a healthy weight, and consuming a well-balanced diet. These activities require good self-management and understanding of the

patients during their office visits. Assessing health literacy requires providers and healthcare team members to determine the patient's health literacy and their ability to understand the requirements for proper blood pressure management. Improved self-management will improve uncontrolled blood pressure if health literacy is addressed during office visits (Du et al., 2018). Halladay et al. (2017) state that lower health literacy is associated with poorer health outcomes. Warren-Findlow et al. (2019) found in a health literacy pilot that teaching self-management skills during a patient's office visit can improve self-care activities among vulnerable populations; however, more research is needed.

Current Approaches to Solving Population Problem(s)

Most completed studies focus on identifying patients at risk or with decreased health literacy and a diagnosis of uncontrolled blood pressure. Warren-Findlow et al. (2019) conducted a two hour course for patients on understanding high blood pressure. Thirty days after the class was completed, a self-report survey was provided inquiring about physical and emotional health options ranging from excellent to poor or fair. Clinical data were obtained, including Body Mass Index (BMI) and blood pressure. The patient's health literacy was measured using the English and Spanish versions of the Newest Vital Sign (NVS). The survey concluded that too many independent variables, including diet and compliance, recruitment, and participant retention, were barriers to success in the study. This study provides an excellent foundation for other studies by giving examples of what worked and what areas could be improved for the subsequent study (Warren-Findlow et al., 2019).

A non-randomized prospective cohort trial was completed that included English-speaking adult patients with uncontrolled blood pressure (systolic blood pressure of 150mmHg or more at their last office visit). Demographics were collected along with blood pressure measurement,

weight, height, and health literacy, which was evaluated using the Short-Test of Functional Health Literacy in Adults. The study showed that using plain language in verbal and print communications can positively impact the self-management of uncontrolled blood pressure (Halladay et al., 2017).

A two-armed randomized controlled trial between February 2017 and August 2018 examined the effect of a web-based self-care program for patients diagnosed with uncontrolled blood pressure. Self-care education included medication adherence, diet, physical activity, weight management, smoking, and alcohol consumption. Two hundred and twenty-two patients were studied at a cardiology clinic in Taiwan. The trial concluded that the most significant benefit of the trial was the immediate ability to consult with those conducting the study for concerns with self-care issues. In addition, findings from the study identified the importance of adaptability as lifestyles differ and vary for each individual. The goal of implementing the interventions was for participants to have increased confidence in the self-management of their blood pressure and achieve home blood pressure control (Chen et al., 2022).

Evidence to Support the Intervention

Despite the lack of concrete evidence that addressing health literacy disparities, providing education and tools for self-management of blood pressure directly impacts blood pressure control in vulnerable populations, interventions in research studies and integrative reviews show that educating patients to better self-manage their lifestyle through proper exercise, diet, and compliance will improve their overall health, including uncontrolled blood pressure (Halladay et al., 2017). There is supporting evidence in the literature providing educational materials adapted to the patient's literacy level during the office visit. Educational materials are a cost-effective

way to provide additional patient education that allows patients to access information outside the clinic (Cote et al., 2021).

Dietary changes such as utilizing the Dietary Approaches to Stop Hypertension (DASH) diet have been shown to lower systolic blood pressure by 5.5mmHg and diastolic blood pressure by 3.9mmHg, compared to no sodium restriction. Therefore, sodium restriction is a primary intervention for people diagnosed with uncontrolled blood pressure. An increase in physical activity is another recommended lifestyle change. Patients should exercise moderate intensity, such as walking, jogging, etc., for at least 30 to 60 minutes, four to seven days per week. Maintaining an average activity exercise routine and dietary sodium restriction have significantly reduced blood pressure (Urrico, 2018).

Self-monitoring or managing blood pressure at home has been shown to reduce systolic blood pressure by increasing patient compliance in patients suspected of non-compliance (Urrico, 2018). Evidence has shown a change in median blood pressure readings with self-monitoring of blood pressure in the home at six months and further changes at 12 months. This intervention should be the first line of treatment and management in patients with uncontrolled blood pressure, even if pharmacological therapy is initiated or in place. Self-management of uncontrolled blood pressure will help attain controlled blood pressure, optimize weight, improve overall health and fitness, and reduce cardiovascular risks (Urrico, 2018).

The project lead collaborated with the project site coordinator and the onsite physician to develop an easy-to-understand handout for patients with uncontrolled blood pressure. Patients with a blood pressure >140/90 were identified at the office visit. At the visit, the patients received a self-management guide, verbal education, and a pre-survey to evaluate their understanding of their overall health perceptions, a personally-communicated lifestyle goal, and

their diagnosis of uncontrolled blood pressure. The patients had a return visit before April 30, 2023, to re-evaluate their completion of logs, compliance with lifestyle changes, and overall blood pressure control. A post survey to evaluate improvement in understanding and personal goal achievement was provided to the patient.

Evidence-Based Practice Framework

The Health Belief Model (HBM) served as an operational framework to guide the health literacy project to improve patients' self-management of uncontrolled blood pressure. This model was developed to understand why individuals fail to adopt disease prevention strategies or decline screening tests for early disease detection (Boston University, 2019). The social scientists that set this model at the United States Public Health Service found that if a person perceives screening or prevention as a possible threat of an illness or disease, it will impact how the person believes that prevention or screening is effective and beneficial to their overall well-being. The six concepts consisting of Boston University's *Health Belief Model* (2019) include the following:

- A person's perception of susceptibility to acquiring an illness or disease; The model assists in understanding and predicting changes in health behaviors related to an individual's overall health.
- A person's perception of how severe contracting an illness is or what medical consequences could come from the disease, such as death or disability.
- A person's perception of the benefit of screening or prevention to reduce the threat of or cure of the illness or disease.
- A person's perception of potential barriers or obstacles, such as side effects, time, inconvenience, and possible pain.

- Lack of understanding due to no internal stimulus triggering the decision of medical action, such as symptoms, or no external stimulus, such as advice from a family or friend, newspaper, etc.
- Lack of confidence in the ability to carry out recommended behavior.

The *Health Belief Model* (Boston University, 2019) applied to the project by the providers evaluating the patient's perception of:

- Their blood pressure and diagnosis of uncontrolled hypertension.
- What consequences could come from uncontrolled blood pressure?
- The benefit of checking one's blood pressure at home to self-manage and better control their blood pressure readings, reducing salt intake in their diet, drinking more water, and being active daily.
- Potential barriers to completing these daily tasks include time and inconvenience.
- Potential internal barriers include family or friends' input, their understanding or research, or external barriers, including lack of symptoms.

Ethical Consideration & Protection of Human Subjects

Collaborative Institutional Training Initiative (CITI) modules and formal education on Institutional Review Board (IRB) approval process were completed before the project's implementation. The project site provided written approval to complete the project at the chosen project site. Any projects involving human subjects require Institutional Review Board approval to protect participants, and the project has no ethical concerns. The project lead completed the Self-Certification Quality and Institutional Review Board (IRB) worksheet required by the University. Following the worksheet's submission, the University deemed the project quality improvement without requiring further IRB review. Once the university process was complete,

the project lead submitted information to the project site, which was reviewed and approved. The site agreed that the project was a quality improvement and that no further IRB review was required for the organization Following the successful completion of IRB approval and CITI modules, the project lead, project site coordinator, and onsite provider initiated the study with the support of the project faculty.

Ethical principles discussed in the Department of Health, Education, and Welfare's *Belmont Report* (1979) were considered in the development and throughout the project implementation. These principles included the following:

- The principle of respect for persons by maintaining respect for those involved in the project and allowing the patients to have autonomy in the decision to participate in the project, comply with requested tasks, and willingness to return for follow-up.
- The principle of beneficence is treating all patients with respect, respecting their decisions, protecting them from harm, and ensuring their well-being.
- The principle of justice is that all patients in the project are treated equally. Therefore, all patients with uncontrolled blood pressure were invited to participate in the project.

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Section III. Project Design

Project Site and Population

The project site had a predominantly rural, underserved population diagnosed with uncontrolled blood pressure. The project lead worked with the site coordinator and onsite physician to develop an easy-to-understand handout for patients with uncontrolled blood pressure. At the office visit, these patients were identified with a blood pressure >140/90. Facilitators to implementing this project include strong leadership, well-designed strategies, well-designed educational materials, proper time allowance for scheduled visits to educate patients and follow-ups, and access to blood pressure cuffs through local pharmacies. Barriers to implementing this project include patient non-compliance.

Description of the Setting

The project occurred in a family medicine clinic in Nash County, where approximately 47.6% of the residents live in a rural setting. The clinic provides care to patients from newborns to geriatric, regardless of ability to pay, including self-pay, Medicaid, Medicare, Tricare, and privately insured patients. The clinic has two providers, a physician and a nurse practitioner. An average of 15 patients are seen by each provider daily. Office visits may include established care, routine follow-up visits, Emergency Department, or Hospital follow-ups. The clinic was an ideal site for this project due to serving an underserved population that has a high Medicaid and Medicare population in a rural area.

Description of the Population

The population of patients that are served at this clinic varies. According to the United States Census, data shows demographic data for Nash County as 53.5% are White, 42.1% are Black, 1.2% are American Indian, 1.2% are Asian, and 0.1% are Native Hawaiian or Other

Pacific Islander (United States Census, 2021). Regardless of the ability to pay, all patients receive care, including self-pay, Medicaid/Medicare, Tricare, and those with private insurance payors (UNCPN, 2022). Ages include newborn to geriatric patients.

The staff at the clinic that provided care included two providers, a male Caucasian physician in his late 30s and a female Caucasian nurse practitioner in her late 30s, who served as the project lead. Two medical assistants at the clinic are African American females, one in her late 20s and the other in her early 40s. The laboratory staff is an African American female in her late 40s. The front desk staff includes a Caucasian female in her early 60s and an African American female in her early 50s.

Project Team

The project team that initiated and supported the project throughout its entirety included the project lead, the project site coordinator, the onsite physician, and the faculty. The project lead is a nurse practitioner that provides direct patient care to the patients served in the clinic. The project lead worked with the project site coordinator and the onsite physician to identify patients that had a current blood pressure that was “uncontrolled” (>140/90). The project faculty worked with the project lead with the provision of project time logs, data collection, project tools, and regular reviews of the overall project to provide constructive feedback as well as guidance for adherence to expectations of the Doctor of Nursing Project curriculum.

The project site coordinator was the regional operations leader within the organization. The coordinator is a vital member at the project site. The project site coordinator assisted the project lead in identifying high-risk patients using meaningful use and quality reports from the Electronic Health Record and other data collection reports.

The physician in the clinic worked alongside the project lead and project site coordinator to identify patients with uncontrolled blood pressure. In addition, the physician provided consistent and regular feedback weekly with the project site coordinator and project lead. The physician also provided self-management tools and education to the patients during the office visit and re-evaluated compliance and completion of logs at the patient's follow-up appointment during the project implementation period.

Project Goals and Outcome Measures

The project aimed to implement a self-management program for patients with uncontrolled blood pressure defined as > 140/90. During the office visit, patients with a blood pressure of >140/90 were provided educational materials, including lifestyle changes, diet, and exercise. Patients were provided a tracking log for at-home blood pressure measures included in the Self-Management Guide, a water diary, an activity log, and a weight log. The patients were also provided with information regarding recommended diet. One measurable tool used in the project was an initial pre-survey to evaluate the patient's understanding of lifestyle, diet, and how to take blood pressure at home. Patients were asked to write a goal to meet by their follow-up visit to help control their blood pressure. At the follow-up visit, the date of the visit, post-survey results, completion of blood pressure, water diary, weight logs, and repeat blood pressure measurement were obtained by staff to evaluate patient compliance and understanding. These actions were also documented in their medical record. Measurable outcomes included the number of patients who successfully demonstrated appropriate blood pressure measurement in the office at follow-up visits; and the number of patients who had an improved understanding of dietary and lifestyle changes based on pre-and post-survey results. Patients were tracked using a

random identifier, the date of the initial office visit, their blood pressure measurement, completion of pre-survey, stated goal, and receipt of the self-management guide.

Description of the Methods and Measurement

The first phase of this project was for the project lead and onsite provider to identify patients with a blood pressure of >140/90 during their office visit. At the initial visit, a pre-survey (Appendix B) was provided to the patient along with educational materials, including a Self-Management Guide with a blood pressure diary (Appendix C), dietary changes that are low sodium (Appendix D), activity log (Appendix E), weight log (Appendix F), and water diary (Appendix G). The patient was then scheduled to return between four weeks to three months. The patients were tracked with no patient identifiers on the data collection tool. The patients' pre-survey was labeled with a random patient identifier that matched data on the data collection tool. The pre-survey consisted of five questions on a four-point Likert scale and one open-ended question on the patient's perception of blood pressure self-management at home.

The second phase was having the patient return within three months (before April 30, 2023). At the follow-up visit, the patient was asked to provide completed logs or diaries, complete a post-survey (Appendix H), and a blood pressure measurement. The post-survey consisted of five questions on a four-point Likert scale and one open-ended question about change. This information was recorded on the data collection tool and evaluated for improvements in patient-reported understanding of self-management based on responses on the post-survey compared to pre-survey responses.

Discussion of the Data Collection Process

Data collected for this project included both qualitative and quantitative data. Qualitative data collected can be used to assess potential improvements to the project and create additional

follow-ups. Qualitative data include responses from open-ended questions on the pre-and post-surveys, including the patient's self-stated lifestyle goal. Quantitative data included blood pressure measurements from the initial and follow-up visits to evaluate compliance with lifestyle changes. At the initial visit, a random identifier was assigned and entered into the Project Tracking Tool (Appendix I). Data collected included confirmation of the provision of a self-management guide, completion of pre-survey, blood pressure reading confirming a reading >140/90, and who the information and education were provided by. At the follow-up visit, the appointment information, including the date, the blood pressure reading, and compliance in completion of the project tools were entered on the project tracking tool.

Implementation Plan

The project team identified scheduled patients with a current reading of uncontrolled blood pressure (<140/90). The project site coordinator provided reports of patients who failed to follow up with a previous diagnosis of hypertension with a reading of >140/90 at their last office visit. Patients identified were contacted for an appointment to be evaluated by the onsite provider or project lead. At that time, the onsite staff provided the patient with a pre-survey to assess their understanding of uncontrolled blood pressure. The survey was then provided to the onsite provider or project lead, who initiated verbal education to the patient discussing the project tools and how the patient may use them to self-manage their blood pressure. The patient set a self-stated lifestyle goal to implement by the next visit to improve self-management of their health.

At the follow-up visit, the patient was provided with the post-survey to re-evaluate their understanding of uncontrolled blood pressure and whether they partially or fully met their self-stated goal from the pre-survey. The patient was also asked to provide the tools they used to meet

their goal and improve their blood pressure. The provider and the patient identified and discussed any barriers to help continue to improve their self-management of their uncontrolled blood pressure. The patient's compliance and completed tools were documented on the Project Tracking Tool.

Timeline

The project plan began in May 2022 with initial discussions with the project site coordinator. Once a well-defined goal was agreed upon with the project lead and site coordinator, a literature review was conducted from July 2022 through November 2022. Educational materials were compiled, drafted, and reviewed in December 2022 with the onsite physician, project site champion, and faculty. The project began in January of 2023 by disseminating the pre-survey, educational materials, teaching, and a self-management guide at the project site for any patient with a blood pressure reading of >140/90. Patients were scheduled for a follow-up visit within three months to verify understanding and compliance. At the follow-up visit, the patient provided any completed logs and completed a post-survey. In addition, the patients were evaluated on knowledge changes on how to self-manage their blood pressure at home and identify one lifestyle change made since their last visit. The project data collection ended on April 28, 2023. See Appendix J for a detailed project timeline.

Section IV. Results and Findings

Results

Forty-four patients were identified and agreed to participate in the project, 15 (34%) males and 29 (66%) females. Patient demographics included 15 (34%) White, non-Hispanic patients, 28 (64%) Black American patients, and one (2%) White Hispanic patient (Appendix L). During the project implementation over 12 weeks, 33 (75%) patients returned for a follow-up visit. Of the 33 patients, 12 (37%) did not make lifestyle changes to improve their blood pressure, and 21 (63%) patients successfully made at least one lifestyle change to improve their health. The most consistent lifestyle change that was noted was increasing their activity to at least 20 minutes of exercise per day. A total of 13 patients (39%) had improved blood pressure at their next subsequent visit. In comparison, 20 patients (61%) continued to have uncontrolled hypertension (See Appendix M).

Discussion of Major Findings

The evidence in the literature supported the findings that patients who actively participated in self-management of their uncontrolled blood pressure did see improvements in their blood pressure (Urrico, 2018). Of the participants who returned for follow-up visits, thirteen (39%) patients had improved blood pressure. Educating patients to self-manage their lifestyle through proper exercise, diet, and compliance will improve their overall health, including uncontrolled blood pressure (Halladay et al., 2017). This project provided a self-management guide, including a blood pressure diary, an activity log to encourage exercise, and a diet plan to follow. Educational materials are a cost-effective way to provide additional patient education, allowing patients access to information outside the clinic (Cote et al., 2021). It is imperative to design educational materials and tools at a health literacy level appropriate for the

patient population. By using education materials that individuals can understand, an individual is more apt to follow and adhere to the necessary activities to improve blood pressure control, lifestyle and overall health. Patients that took an active approach to self-managing their health saw improvements in their blood pressure by their follow-up visit and reported being more motivated to increase their activity than any other lifestyle goal. The project was able to capture all patients identified with a blood pressure >140/90 seen by the nurse practitioner.

There were gaps in this project as well. Provider time constraints and availability did not allow the capture of all patients eligible to participate with a diagnosis of uncontrolled blood pressure by the physician. Also, patient compliance and socioeconomic disparities, such as lack of transportation, created barriers to the project. Halladay et al. (2017) state that patient compliance limitations and time constraints to evaluate blood pressure control properly are barriers to implementing improved health outcomes and self-management of the patient's health.

Section V. Interpretation and Implications

Costs and Resource Management

The project cost includes direct costs such as the printed materials and supplies to distribute the educational and evaluation tools and the indirect costs of the providers, staff, and faculty's time. The total direct costs to implement the project were estimated at $157.99. Indirect costs to implement the project were $3,160.00. In this project, the proejct lead was also the Nurse Practitioner, so the time spent implementing and educating patients was associated with those costs. The project lead spent approximately eight to ten hours a week working directly on the project outside of the face-to-face with patients to research demographic information, record information, and meet with staff, providers, and administration, who also served as the project site coordinator. See Appendix K for the itemized budget, including direct and indirect costs for the project.

If this project is to be implemented on a larger scale and expanded to all outpatient primary care clinics, the suggestion would be to have the project lead not be a face-to-face provider with the patients being evaluated. A population health nurse or quality team could complete and coordinate the project by training staff and providers to identify patients, track participating patients, provide necessary educational tools, , and track follow-up. This would allow for better provider and staff support, better record tracking, and flexibility to outreach to the other clinics.

Uncontrolled blood pressure costs an average of $131-198 billion each year, including healthcare visits, prescriptions, and loss of productivity due to premature mortality (Centers for Disease Control [CDC], 2022b). The direct and indirect costs totaled $3,317.99 for the three months of this project. This cost would be $13,271.96 for a year, still reflecting significant

savings from the annual cost of health care due to uncontrolled hypertension. The cost could vary based on how many providers, staff, and project coordinators were involved and if grants are available through government or educational institution for financial assistance or funding.

Implications of the Findings

Implications for Patients

The project positively impacted patients that had a diagnosis of uncontrolled blood pressure. Educating patients on self-management through proper exercise, diet, and compliance helps improve their overall health, including uncontrolled blood pressure (Halladay et al., 2017). There was a 50% increase in patient compliance after the implementation of this project, resulting in improved hypertension goals which ultimately reduced complications of uncontrolled blood pressure such as myocardial infarction, stroke, and chronic renal failure. The project aligns with the Institute for Healthcare Improvement's (IHI) Triple Aim by improving patient quality and satisfaction, improving the health of Nash County's residents, and reducing healthcare costs to both the patient and the organization (IHI, 2022).

Patients have increased costs related to uncontrolled blood pressure, such as prescription antihypertensives, more frequent doctor's visits, and more risk for hospitalization. The annual cost for patients with uncontrolled blood pressure is $2,500 higher than those without (CDC, 2022b). An estimated 650 million prescriptions for blood pressure are filled each year, costing around $29 billion in total spending, with $3.4 billion paid directly by patients in the United States (CDC, 2022b). Therefore, improving uncontrolled blood pressure has a significant impact on the patient's overall health as well as their financial well-being.

Implications for Nursing Practice

The project benefits the patient, the provider, and the organization by increasing awareness of self-management, lifestyle changes necessary, and improvement of blood pressure awareness. This positive impact on health behaviors will also help decrease other comorbidities such as diabetes, chronic kidney disease, cerebrovascular accidents, and more with controlled blood pressure. (Carey et al., 2018). Based on the patient's insurance, there is a minimal financial impact to the patient to obtain a blood pressure cuff (average cost is $20 if not covered by the patient's insurance) for at-home monitoring and lifestyle changes such as increased activity, drinking more water, eating lower salt, etc. hypertension.

Self-management interventions help patients understand their blood pressure and how to manage their hypertension better. Nurses working alongside the providers teaching these interventions can reduce and control the increasing growth of patients with hypertension. Increased skills and knowledge of how to self-manage the patient's health and blood pressure help prevent the increase of cardiovascular disease-related complications, including a reduction in morbidity, disability, and mortality in the community. Patients who are more involved with the self-management of their blood pressure reduce the pressure and demand on nursing staff and provide more efficient and quality nursing in the clinical setting (Ying & Fangling, 2021).

Impact for Healthcare System(s)

The project can potentially improve quality measures, meaningful use, and hypertension risk scores for patients.). Improving blood pressure and patients' overall health decreases comorbidities and mortalities related to stroke, heart attack, and kidney disease. Addressing the patient's understanding and health literacy will increase the patient's use of preventative health care, decrease unnecessary emergency room visits or hospital stays and readmissions, improve

health outcomes and enhance all six aims of quality improvement, including safe, effective, patient-centered, timely, efficient and equitable care (HRSA, 2022). ACOs and CMS hold organizations accountable by providing reimbursement incentives for improving the overall health and well-being of the population.

Sustainability

The findings of this project reinforce the importance of continuing the project. The project lead, project site coordinator, and onsite provider discussed and agreed to disseminate the project educational materials and findings throughout the regional outpatient family practice clinics. The project lead will continue to educate other providers, clinical staff, front office staff, and quality team members on providing educational materials to foster patients' self-management in controlling their blood pressure and evaluate the patient's progress. The patient self-management guide may also be adapted for other morbidities such as obesity and diabetes.

Dissemination Plan

The project was presented to project site leadership on April 25, 2023, and it was agreed to disseminate it to the regional primary care offices. The project was presented to peers and University faculty during a poster presentation on July 11, 2023 (See Appendix N). The final paper will be submitted to the University Scholarship Repository for public access. A manuscript will be submitted to *The Journal for Nurse Practitioners* in October 2023. An abstract for a poster presentation will be submitted to the North Carolina Nurses Association (NCNA) Nurse Practitioner 2024 Spring Symposium. The audience will include nurse practitioners and nurse practitioners' students who would benefit on findings from the project for adoption of intervention into their practice.

Section VI. Conclusion

Limitations and Facilitators

There were limitations during the implementation of this project noted by the project lead. The onsite provider was limited in presenting the pre-survey and self-management tools during visits with patients with uncontrolled blood pressure due to time constraints, patient volumes, and allotted appointment lengths. Another limitation was patient compliance. Some patients did not return for their follow-up appointments, canceled their appointments, did not complete the tracking tools, or did not take their medications as prescribed. One patient indicated she had transportation issues and could not get to the clinic, despite the organization offering transportation. Another patient relocated from the area and could not return for the follow-up visit. Educational materials and tracking tools were limited to only being available in English. Fortunately, all patients that participated could read and write in English.

The project's facilitators included multiple stakeholders, including the healthcare organization, the administration, and the staff at the project site. The project would not have been a success without their engagement and cooperation. The project site coordinator was engaged throughout the project and provided input, suggestions to improve processes, and quality measure reports to help identify patients needing follow-up. The project lead composed and distributed educational materials to project staff and the onsite provider to streamline the process of assisting patients in learning and adopting self-management of their uncontrolled blood pressure and overall health.

Recommendations for Others

A recommendation for others who would like to adopt this project into their facility would be to designate a project lead that is not directly involved in patient care. Having a

designated individual would provide continuity of care for the patient and allow for one-on-one consultation and follow-up. Providers could refer patients with uncontrolled blood pressure to the designated individual for further education and follow-up, if necessary. Also, this individual can ensure that every patient diagnosed with uncontrolled blood pressure is identified and has continued follow-up. The project materials should also be available in multiple languages for non-English speaking patients based on the population's needs and be appropriate to meet the patient's health literacy. It is also recommended to have blood pressure cuffs available for patients to purchase out of pocket or rent from the office to improve compliance with blood pressure measurements at home. Another recommendation would be to incorporate blood pressure readings submission through the patient portal by the patient. This would decrease time and transportation burdens to the patient but allow for continuous follow-up in self-management and home blood pressure readings. The project could be expanded to all primary care clinics within the organization for the best results.

Recommendations Further Study

Recommendations for further study are to include both urban and rural populations. The project methods and materials may also be adapted to other high-risk diseases such as obesity, diabetes, chronic kidney disease, etc. It is recommended that patients and families participate in educational materials development along with the healthcare organization's leadership to ensure that the content is patient-friendly, understandable, and to avoid conflicts of interest or risk concerns. Another recommendation would be to use electronic patient portals for patients to be able to track their activity, diet, water intake and submit blood pressure to the clinic. This would allow for more real-time results and more convenience for patients with transportation issues.

Final Thoughts

The community's health is imperative for the future population to promote higher functioning and a healthier society. Assisting patients with taking control of their health, including their blood pressure, empowers and improves the health and well-being of individuals and their communities. Healthcare providers must provide patients with the tools needed to be successful and promote patient engagement in their healthcare decisions and management of their care. These tools must be patient-friendly, easy to understand, and available in languages patients can read. Any barriers should be identified and addressed, if possible, for the patient to have the most excellent chance of success in self-management of their uncontrolled blood pressure. Providers must be engaged throughout the process and ensure their availability for patients to follow up for assessment of understanding of their health and overall blood pressure control. By working together, patients, the community, and the healthcare system will decrease healthcare costs and impact the community's overall well-being.

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Appendix A

Literature Search

Student: Brittany Hines				**Date of Submission: 11/28/22**	
Project Title:Self-Management of Uncontrolled Blood Pressure					
Date of Search	**Database**	**Key Word Searches**	**Limits**	**# of Citations Found / Kept**	**Rationale for Inclusion / Exclusion (include rationale for excluding articles as well as for inclusion)**
7/12/2022	Google Search	Health literacy AND uncontrolled hypertension	5 year period, English language.	100+ found, 6 kept	Most were redundant or unreliable sources; kept articles that were up to date, reliable information with good evidence-based research.
7/13/2022	Google Search	ACO measures for uncontrolled blood pressure AND Healthy People uncontrolled blood pressure	5 year period, English language.	25 found, 3 kept	Kept primary sources as much as possible.
7/15/2022	CINAHL	Uncontrolled hypertension AND health literacy	5 year period, full text, English language	17 found, 5 kept	Kept articles directly related to DNP Project topic. Did not keep articles that were not relatable to

					United States population.
11/22/2022	CINAHL	Self-management AND blood pressure AND diet AND lifestyle changes AND weight control	5 year period, full text, English language	6 found, 2 kept	Kept articles directly related to DNP Project topic. Did not keep articles that were not relatable to United States population.

Appendix B

Pre-Survey

SELF-MANAGEMENT OF BLOOD PRESSURE PRE-EDUCATION SURVEY

Q1 I understand what it means to have high blood pressure.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q2 I feel comfortable with taking my blood pressure at home.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q3 I feel confident I follow a low sodium diet to prevent increased blood pressure.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q4 My activity level is at least 20 minutes at least 3 days a week.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q5 I understand how much water intake I should have daily.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q6 What is one change you would like to make by your next visit? _____				

Appendix C

Self-Management Guide

I have uncontrolled blood pressure... Now what?

GOALS:

Understand what high blood pressure is.

Understand how to take blood pressure at home.

What lifestyle changes you can make to improve blood pressure.

A guide to get your blood pressure and your health back on track in three months!

Self-Management Guide

Changing Habits...

Diet and exercise can help you get your blood pressure and health back on track.

What does lifestyle have to do with my blood pressure?

What you do and the foods you eat has a big impact on your blood pressure. By making lifestyle changes, you may be able to:

- Lower your BP.
- Decrease need for BP medication.
- Work with your current medications.
- Lower risk for heart attack or stroke.

What can I do to lower my blood pressure?

- Lose weight if you are overweight.
- Eat a healthy diet — Fruits, veggies, low-fat dairy, lwhole grain.
- Eat less meats, sweets and refined grains (white snacks).
- Less salt in diet.
- Be active at least 30 minutes per day.
- Limit alcohol.
- Quit smoking.

CHECKING YOUR BP AT HOME

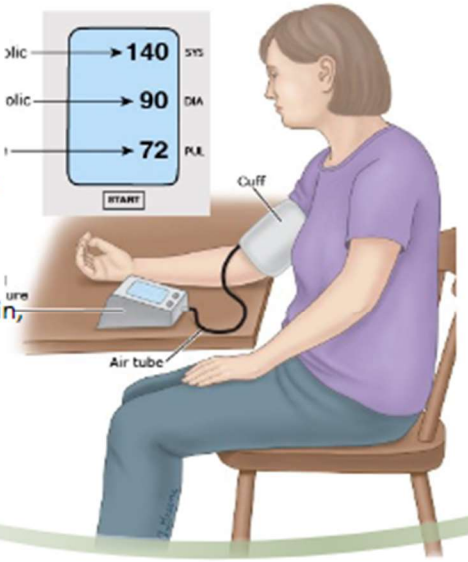
- Sit in chair with feet flat on the floor.
- Breathe normally, stay calm.
- Attach cuff to arm directly on skin.
- Relax for 3-5 minutes before taking BP.
- Follow BP cuff machine instructions.
- Log your BP results.
- If you need to do it again, wait at least 1 minute.

What if my BP is high?

If your blood pressure is greater than 180/100, contact your primary care office.

If your blood pressure is only a little high, your primary care office may ask you to keep checking and to call if it does not go down or goes up.

If you experience headache, blurred vision, facial droop, slurred speech, confusion, weakness. **Call 911** as these may be signs of a stroke.



START LOW AND GO SLOW

You do not have to change everything at once.

Make one small change and keep going until it becomes a habit.

Add another change.

Continue!

Don't give up!

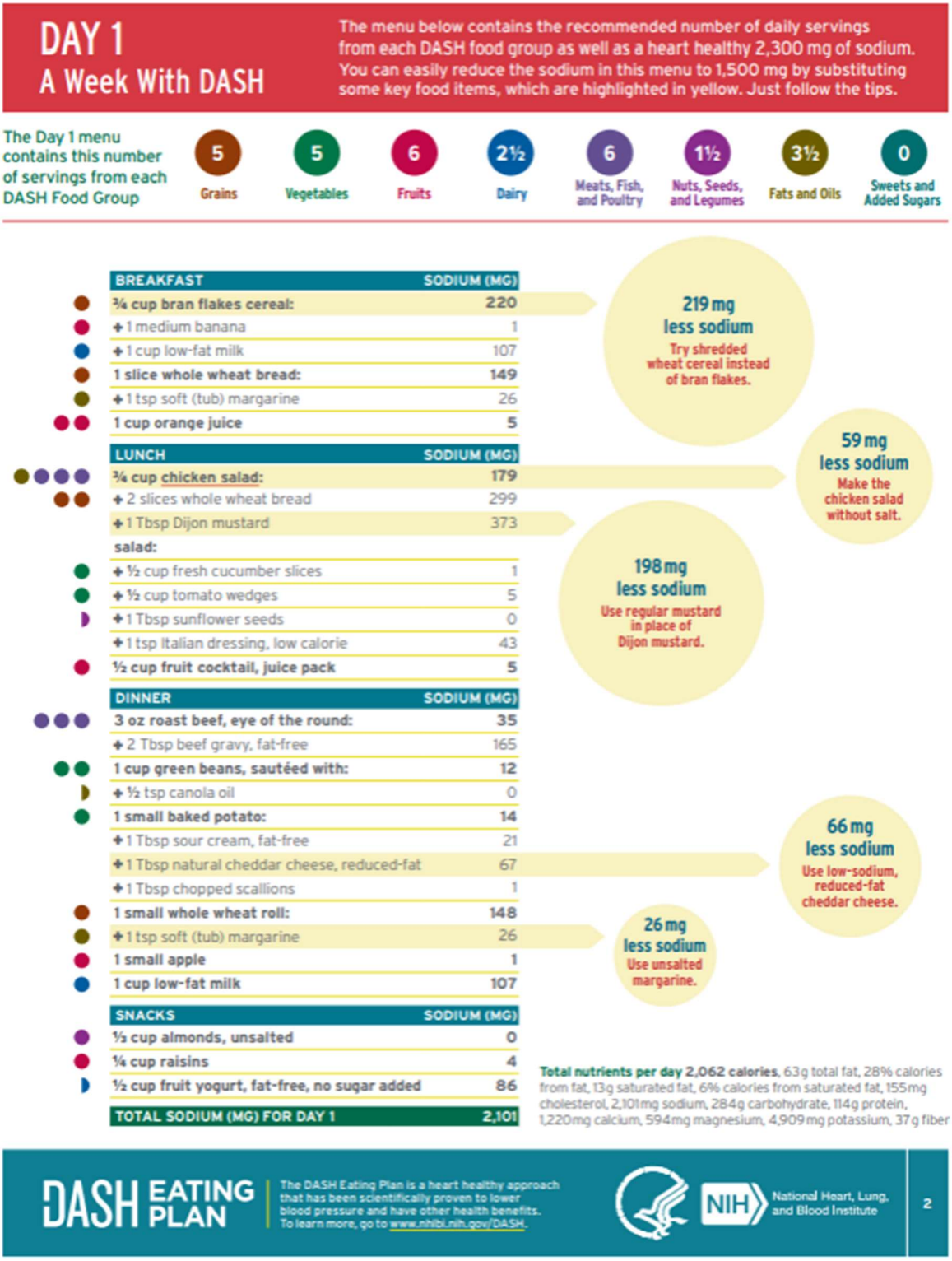
Blood Pressure Diary

Write down your BP every day and bring to your next office visit.

Date:	Time:	Arm:	Blood Pressure:

Appendix D

Dietary Approach to Stop Hypertension (DASH) Diet



DAY 1
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 1 menu contains this number of servings from each DASH Food Group

5	5	6	2½	6	1½	3½	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
¾ cup bran flakes cereal:	220
+ 1 medium banana	1
+ 1 cup low-fat milk	107
1 slice whole wheat bread:	149
+ 1 tsp soft (tub) margarine	26
1 cup orange juice	5

LUNCH	SODIUM (MG)
¾ cup chicken salad:	179
+ 2 slices whole wheat bread	299
+ 1 Tbsp Dijon mustard	373
salad:	
+ ½ cup fresh cucumber slices	1
+ ½ cup tomato wedges	5
+ 1 Tbsp sunflower seeds	0
+ 1 tsp Italian dressing, low calorie	43
½ cup fruit cocktail, juice pack	5

DINNER	SODIUM (MG)
3 oz roast beef, eye of the round:	35
+ 2 Tbsp beef gravy, fat-free	165
1 cup green beans, sautéed with:	12
+ ½ tsp canola oil	0
1 small baked potato:	14
+ 1 Tbsp sour cream, fat-free	21
+ 1 Tbsp natural cheddar cheese, reduced-fat	67
+ 1 Tbsp chopped scallions	1
1 small whole wheat roll:	148
+ 1 tsp soft (tub) margarine	26
1 small apple	1
1 cup low-fat milk	107

SNACKS	SODIUM (MG)
½ cup almonds, unsalted	0
¼ cup raisins	4
½ cup fruit yogurt, fat-free, no sugar added	86
TOTAL SODIUM (MG) FOR DAY 1	2,101

219 mg less sodium — Try shredded wheat cereal instead of bran flakes.

59 mg less sodium — Make the chicken salad without salt.

198 mg less sodium — Use regular mustard in place of Dijon mustard.

66 mg less sodium — Use low-sodium, reduced-fat cheddar cheese.

26 mg less sodium — Use unsalted margarine.

Total nutrients per day 2,062 calories, 63g total fat, 28% calories from fat, 13g saturated fat, 6% calories from saturated fat, 155mg cholesterol, 2,101mg sodium, 284g carbohydrate, 114g protein, 1,220mg calcium, 594mg magnesium, 4,909mg potassium, 37g fiber

DASH EATING PLAN

The DASH Eating Plan is a heart healthy approach that has been scientifically proven to lower blood pressure and have other health benefits. To learn more, go to www.nhlbi.nih.gov/DASH.

NIH National Heart, Lung, and Blood Institute

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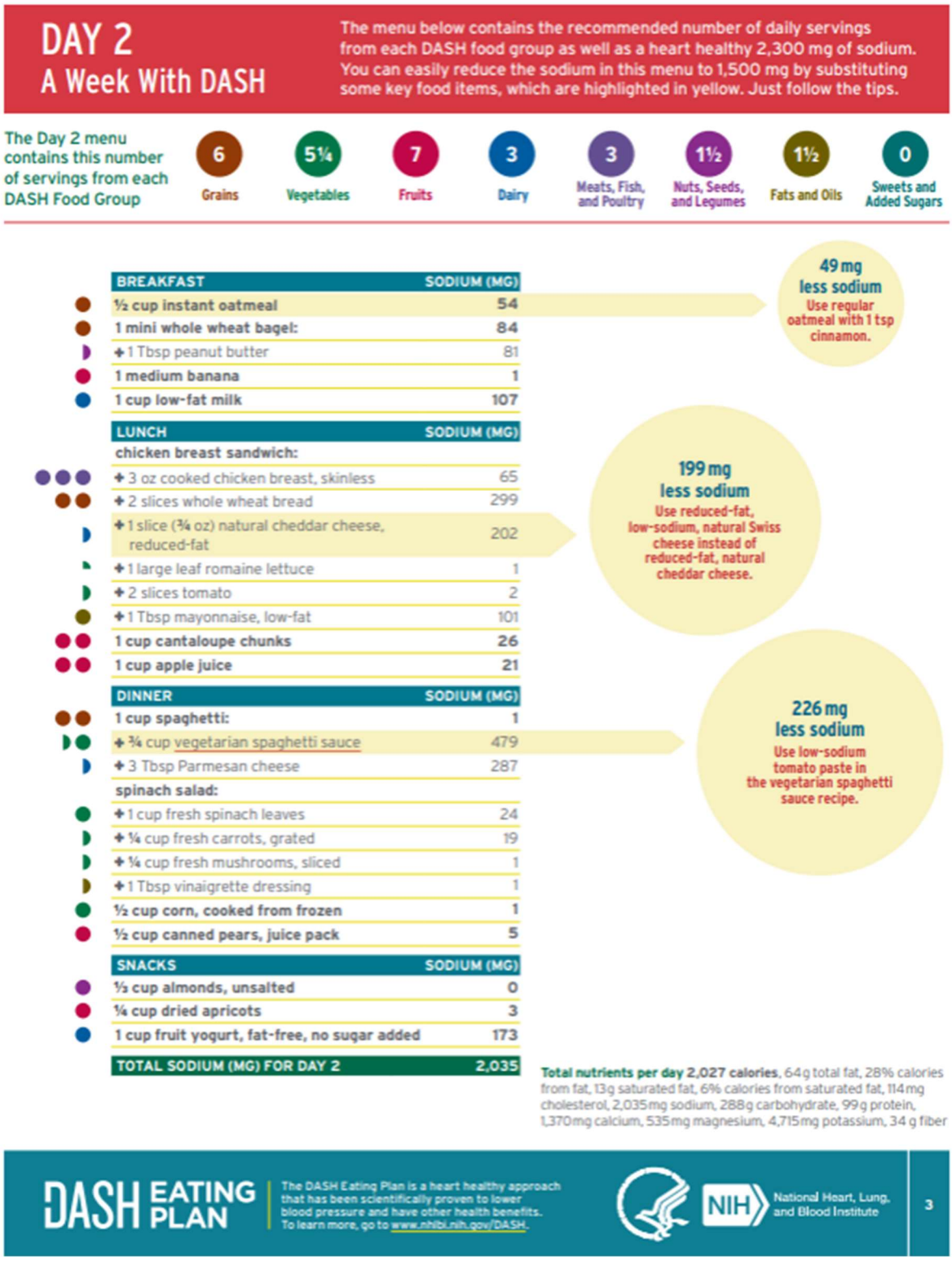

DAY 2
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 2 menu contains this number of servings from each DASH Food Group

6	5¼	7	3	3	1½	1½	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
½ cup instant oatmeal	54
1 mini whole wheat bagel:	84
+ 1 Tbsp peanut butter	81
1 medium banana	1
1 cup low-fat milk	107

LUNCH	SODIUM (MG)
chicken breast sandwich:	
+ 3 oz cooked chicken breast, skinless	65
+ 2 slices whole wheat bread	299
+ 1 slice (¾ oz) natural cheddar cheese, reduced-fat	202
+ 1 large leaf romaine lettuce	1
+ 2 slices tomato	2
+ 1 Tbsp mayonnaise, low-fat	101
1 cup cantaloupe chunks	26
1 cup apple juice	21

DINNER	SODIUM (MG)
1 cup spaghetti:	1
+ ¾ cup vegetarian spaghetti sauce	479
+ 3 Tbsp Parmesan cheese	287
spinach salad:	
+ 1 cup fresh spinach leaves	24
+ ¼ cup fresh carrots, grated	19
+ ¼ cup fresh mushrooms, sliced	1
+ 1 Tbsp vinaigrette dressing	1
½ cup corn, cooked from frozen	1
½ cup canned pears, juice pack	5

SNACKS	SODIUM (MG)
⅓ cup almonds, unsalted	0
¼ cup dried apricots	3
1 cup fruit yogurt, fat-free, no sugar added	173

TOTAL SODIUM (MG) FOR DAY 2	2,035

49 mg less sodium
Use regular oatmeal with 1 tsp cinnamon.

199 mg less sodium
Use reduced-fat, low-sodium, natural Swiss cheese instead of reduced-fat, natural cheddar cheese.

226 mg less sodium
Use low-sodium tomato paste in the vegetarian spaghetti sauce recipe.

Total nutrients per day 2,027 calories, 64 g total fat, 28% calories from fat, 13 g saturated fat, 6% calories from saturated fat, 114 mg cholesterol, 2,035 mg sodium, 288 g carbohydrate, 99 g protein, 1,370 mg calcium, 535 mg magnesium, 4,715 mg potassium, 34 g fiber

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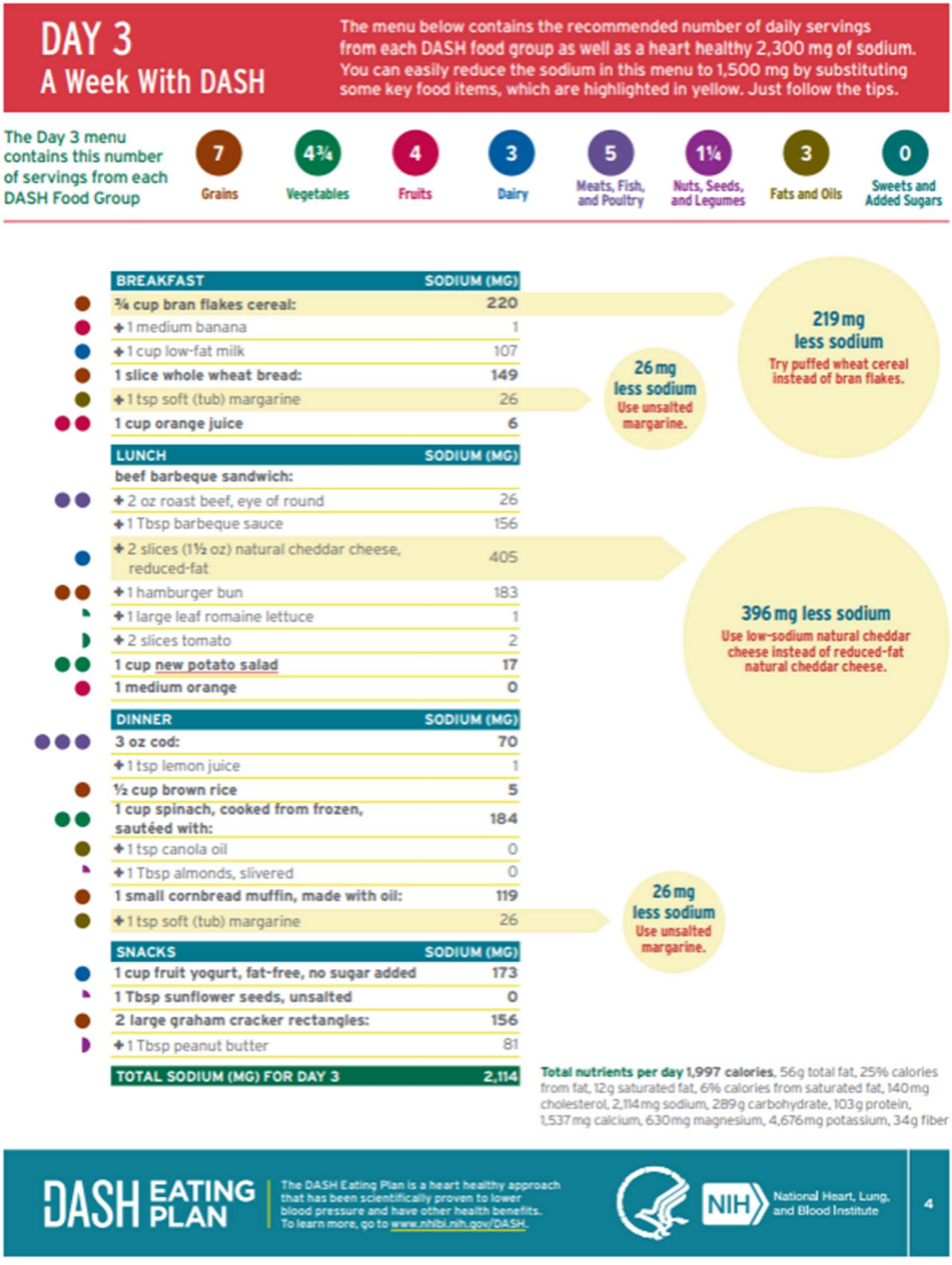

DAY 3
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 3 menu contains this number of servings from each DASH Food Group

7	4¾	4	3	5	1¼	3	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
¾ cup bran flakes cereal:	220
+ 1 medium banana	1
+ 1 cup low-fat milk	107
1 slice whole wheat bread:	149
+ 1 tsp soft (tub) margarine	26
1 cup orange juice	6

219 mg less sodium — Try puffed wheat cereal instead of bran flakes.

26 mg less sodium — Use unsalted margarine.

LUNCH	SODIUM (MG)
beef barbeque sandwich:	
+ 2 oz roast beef, eye of round	26
+ 1 Tbsp barbeque sauce	156
+ 2 slices (1½ oz) natural cheddar cheese, reduced-fat	405
+ 1 hamburger bun	183
+ 1 large leaf romaine lettuce	1
+ 2 slices tomato	2
1 cup new potato salad	17
1 medium orange	0

396 mg less sodium — Use low-sodium natural cheddar cheese instead of reduced-fat natural cheddar cheese.

DINNER	SODIUM (MG)
3 oz cod:	70
+ 1 tsp lemon juice	1
½ cup brown rice	5
1 cup spinach, cooked from frozen, sautéed with:	184
+ 1 tsp canola oil	0
+ 1 Tbsp almonds, slivered	0
1 small cornbread muffin, made with oil:	119
+ 1 tsp soft (tub) margarine	26

26 mg less sodium — Use unsalted margarine.

SNACKS	SODIUM (MG)
1 cup fruit yogurt, fat-free, no sugar added	173
1 Tbsp sunflower seeds, unsalted	0
2 large graham cracker rectangles:	156
+ 1 Tbsp peanut butter	81
TOTAL SODIUM (MG) FOR DAY 3	**2,114**

Total nutrients per day 1,997 calories, 56g total fat, 25% calories from fat, 12g saturated fat, 6% calories from saturated fat, 140mg cholesterol, 2,114mg sodium, 289g carbohydrate, 103g protein, 1,537mg calcium, 630mg magnesium, 4,676mg potassium, 34g fiber

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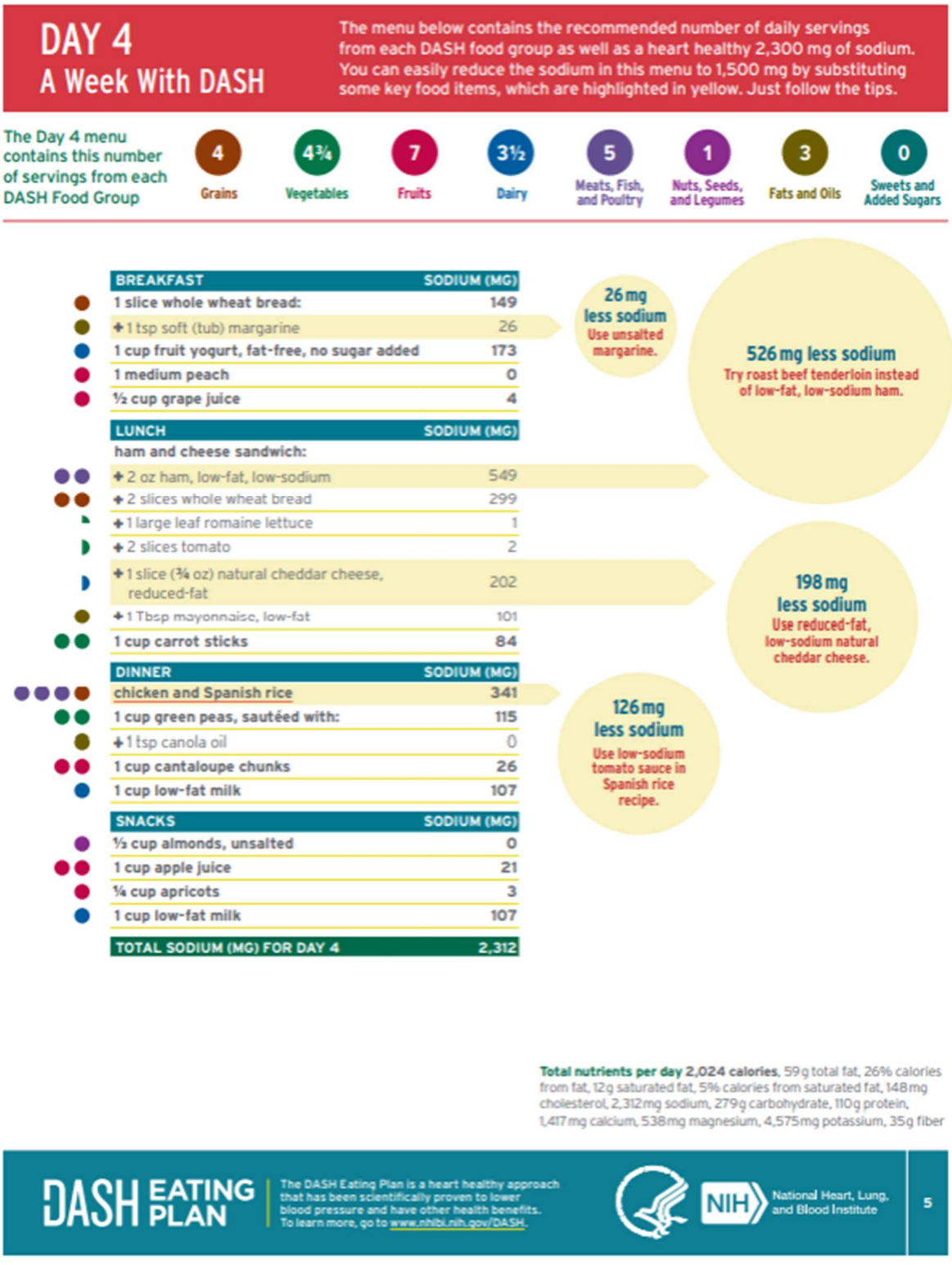

DAY 4
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 4 menu contains this number of servings from each DASH Food Group

4	4¾	7	3½	5	1	3	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
1 slice whole wheat bread:	149
+ 1 tsp soft (tub) margarine	26
1 cup fruit yogurt, fat-free, no sugar added	173
1 medium peach	0
½ cup grape juice	4

LUNCH	SODIUM (MG)
ham and cheese sandwich:	
+ 2 oz ham, low-fat, low-sodium	549
+ 2 slices whole wheat bread	299
+ 1 large leaf romaine lettuce	1
+ 2 slices tomato	2
+ 1 slice (¾ oz) natural cheddar cheese, reduced-fat	202
+ 1 Tbsp mayonnaise, low-fat	101
1 cup carrot sticks	84

DINNER	SODIUM (MG)
chicken and Spanish rice	341
1 cup green peas, sautéed with:	115
+ 1 tsp canola oil	0
1 cup cantaloupe chunks	26
1 cup low-fat milk	107

SNACKS	SODIUM (MG)
⅓ cup almonds, unsalted	0
1 cup apple juice	21
¼ cup apricots	3
1 cup low-fat milk	107

TOTAL SODIUM (MG) FOR DAY 4	2,312

26 mg less sodium
Use unsalted margarine.

526 mg less sodium
Try roast beef tenderloin instead of low-fat, low-sodium ham.

198 mg less sodium
Use reduced-fat, low-sodium natural cheddar cheese.

126 mg less sodium
Use low-sodium tomato sauce in Spanish rice recipe.

Total nutrients per day 2,024 calories, 59 g total fat, 26% calories from fat, 12 g saturated fat, 5% calories from saturated fat, 148 mg cholesterol, 2,312 mg sodium, 279 g carbohydrate, 110 g protein, 1,417 mg calcium, 538 mg magnesium, 4,575 mg potassium, 35 g fiber

DASH EATING PLAN

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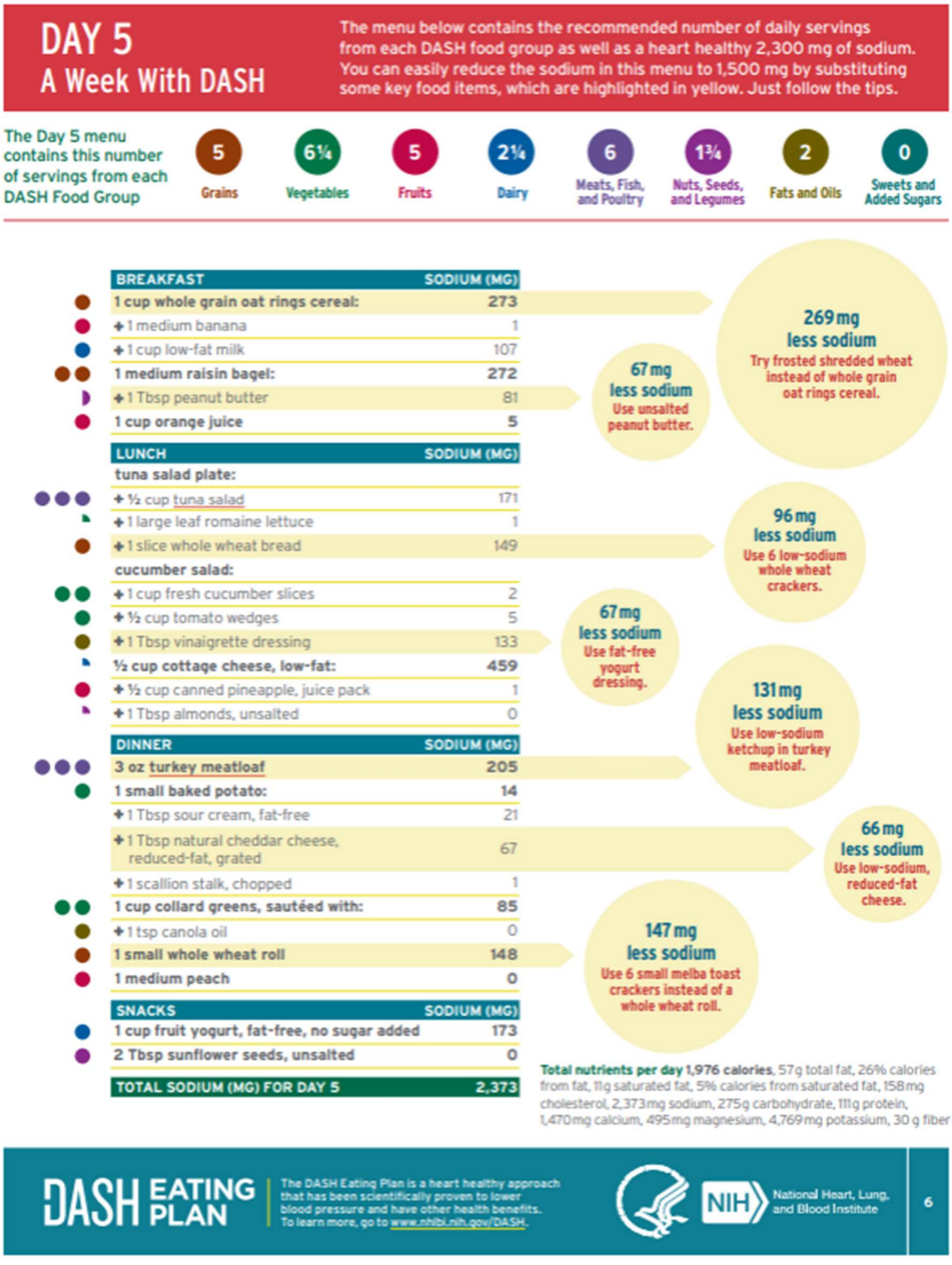


DAY 5
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 5 menu contains this number of servings from each DASH Food Group

5	6¼	5	2¼	6	1¾	2	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
1 cup whole grain oat rings cereal:	273
+ 1 medium banana	1
+ 1 cup low-fat milk	107
1 medium raisin bagel:	272
+ 1 Tbsp peanut butter	81
1 cup orange juice	5

LUNCH	SODIUM (MG)
tuna salad plate:	
+ ½ cup tuna salad	171
+ 1 large leaf romaine lettuce	1
+ 1 slice whole wheat bread	149
cucumber salad:	
+ 1 cup fresh cucumber slices	2
+ ½ cup tomato wedges	5
+ 1 Tbsp vinaigrette dressing	133
½ cup cottage cheese, low-fat:	459
+ ½ cup canned pineapple, juice pack	1
+ 1 Tbsp almonds, unsalted	0

DINNER	SODIUM (MG)
3 oz turkey meatloaf	205
1 small baked potato:	14
+ 1 Tbsp sour cream, fat-free	21
+ 1 Tbsp natural cheddar cheese, reduced-fat, grated	67
+ 1 scallion stalk, chopped	1
1 cup collard greens, sautéed with:	85
+ 1 tsp canola oil	0
1 small whole wheat roll	148
1 medium peach	0

SNACKS	SODIUM (MG)
1 cup fruit yogurt, fat-free, no sugar added	173
2 Tbsp sunflower seeds, unsalted	0

TOTAL SODIUM (MG) FOR DAY 5	2,373

67 mg less sodium
Use unsalted peanut butter.

269 mg less sodium
Try frosted shredded wheat instead of whole grain oat rings cereal.

96 mg less sodium
Use 6 low-sodium whole wheat crackers.

67 mg less sodium
Use fat-free yogurt dressing.

131 mg less sodium
Use low-sodium ketchup in turkey meatloaf.

66 mg less sodium
Use low-sodium, reduced-fat cheese.

147 mg less sodium
Use 6 small melba toast crackers instead of a whole wheat roll.

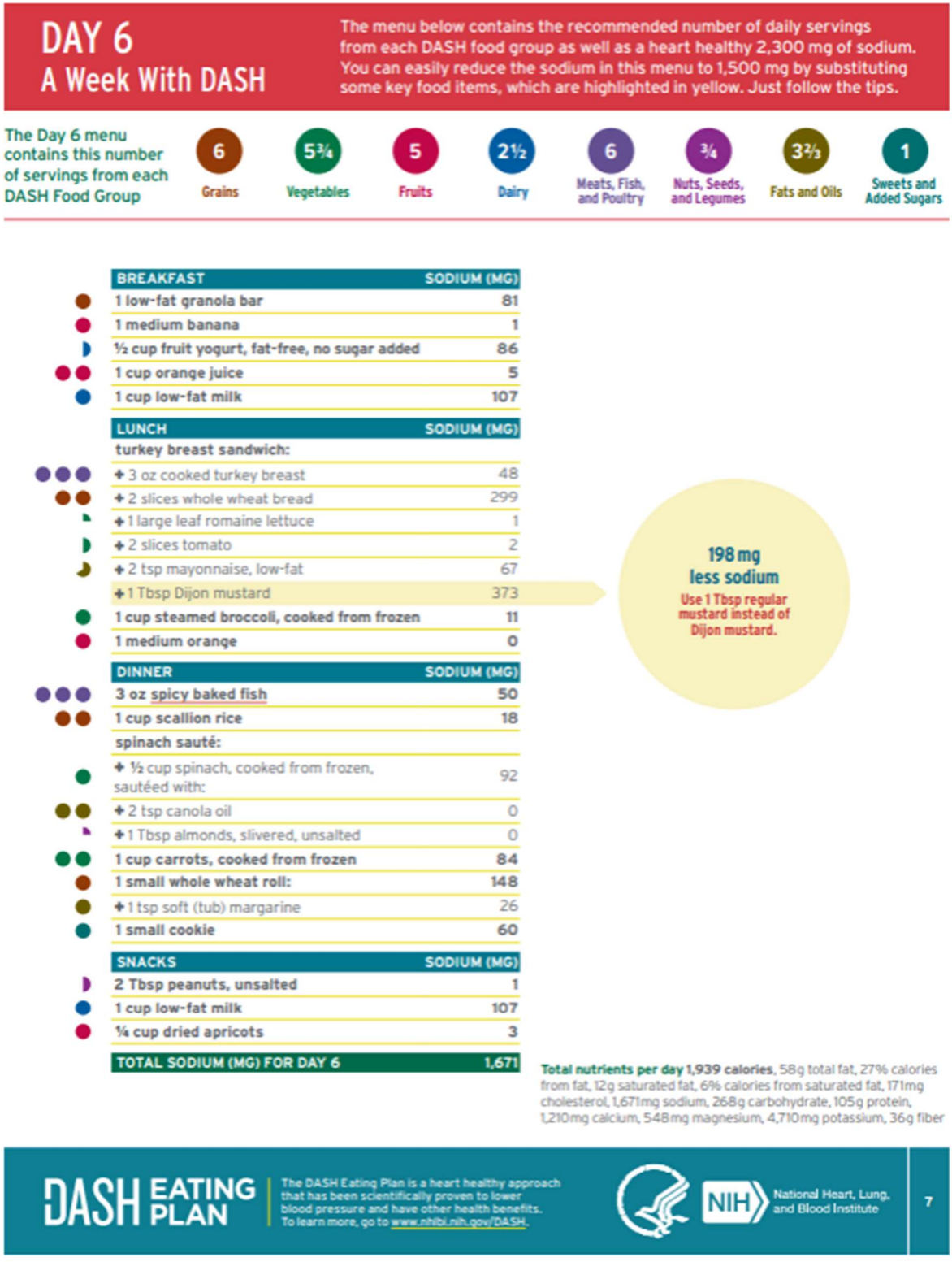
Total nutrients per day 1,976 calories, 57g total fat, 26% calories from fat, 11g saturated fat, 5% calories from saturated fat, 158mg cholesterol, 2,373mg sodium, 275g carbohydrate, 111g protein, 1,470mg calcium, 495mg magnesium, 4,769mg potassium, 30 g fiber

DASH EATING PLAN

The DASH Eating Plan is a heart healthy approach that has been scientifically proven to lower blood pressure and have other health benefits. To learn more, go to www.nhlbi.nih.gov/DASH.

NIH National Heart, Lung, and Blood Institute

6



DAY 6
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 6 menu contains this number of servings from each DASH Food Group

6	5¾	5	2½	6	¾	3⅓	1
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
1 low-fat granola bar	81
1 medium banana	1
½ cup fruit yogurt, fat-free, no sugar added	86
1 cup orange juice	5
1 cup low-fat milk	107

LUNCH	SODIUM (MG)
turkey breast sandwich:	
+ 3 oz cooked turkey breast	48
+ 2 slices whole wheat bread	299
+ 1 large leaf romaine lettuce	1
+ 2 slices tomato	2
+ 2 tsp mayonnaise, low-fat	67
+ 1 Tbsp Dijon mustard	373
1 cup steamed broccoli, cooked from frozen	11
1 medium orange	0

198 mg less sodium
Use 1 Tbsp regular mustard instead of Dijon mustard.

DINNER	SODIUM (MG)
3 oz spicy baked fish	50
1 cup scallion rice	18
spinach sauté:	
+ ½ cup spinach, cooked from frozen, sautéed with:	92
+ 2 tsp canola oil	0
+ 1 Tbsp almonds, slivered, unsalted	0
1 cup carrots, cooked from frozen	84
1 small whole wheat roll:	148
+ 1 tsp soft (tub) margarine	26
1 small cookie	60

SNACKS	SODIUM (MG)
2 Tbsp peanuts, unsalted	1
1 cup low-fat milk	107
¼ cup dried apricots	3

TOTAL SODIUM (MG) FOR DAY 6	1,671

Total nutrients per day 1,939 calories, 58g total fat, 27% calories from fat, 12g saturated fat, 6% calories from saturated fat, 171mg cholesterol, 1,671mg sodium, 268g carbohydrate, 105g protein, 1,210mg calcium, 548mg magnesium, 4,710mg potassium, 36g fiber

DASH EATING PLAN

The DASH Eating Plan is a heart healthy approach that has been scientifically proven to lower blood pressure and have other health benefits. To learn more, go to www.nhlbi.nih.gov/DASH.

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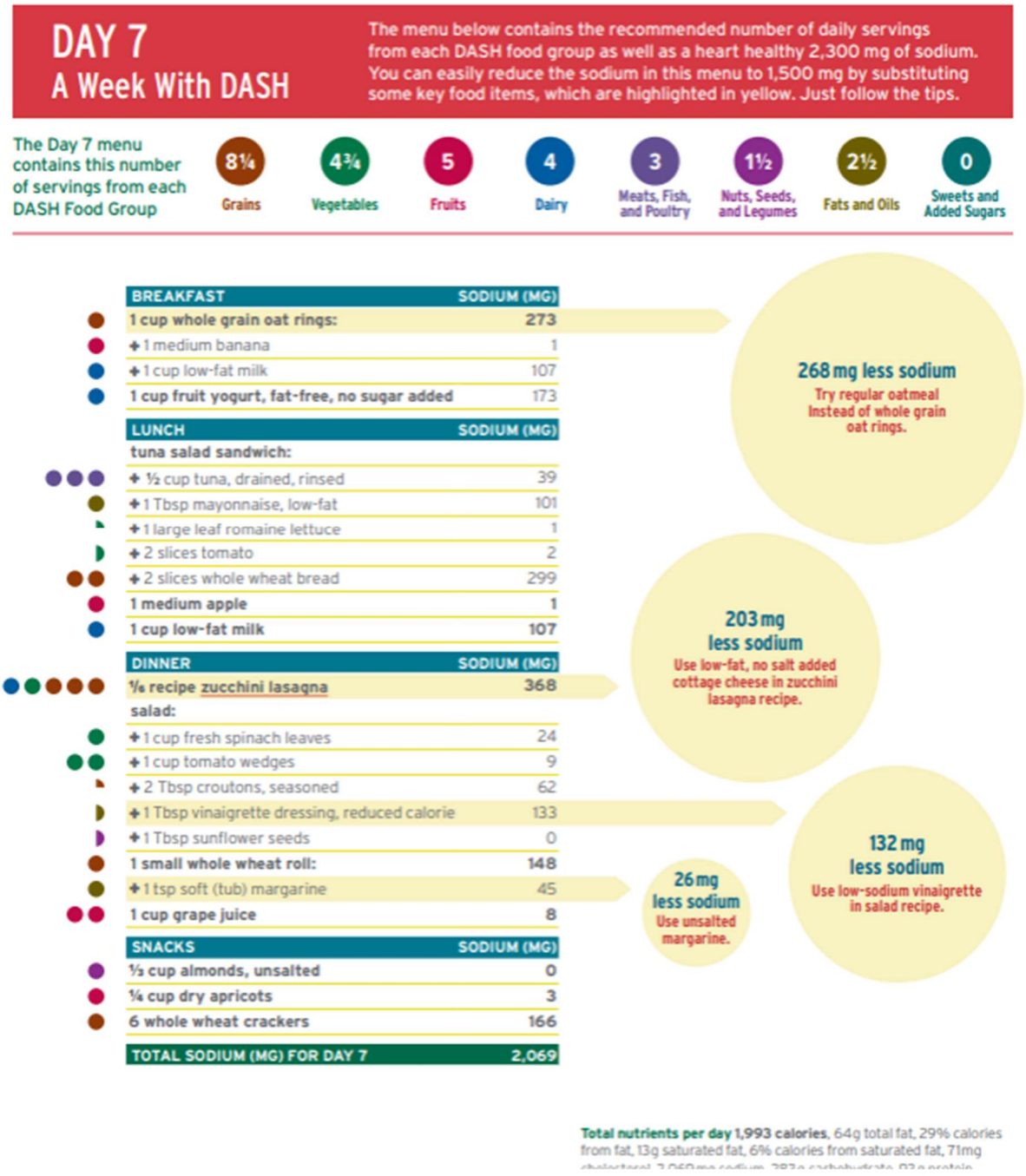

DAY 7
A Week With DASH

The menu below contains the recommended number of daily servings from each DASH food group as well as a heart healthy 2,300 mg of sodium. You can easily reduce the sodium in this menu to 1,500 mg by substituting some key food items, which are highlighted in yellow. Just follow the tips.

The Day 7 menu contains this number of servings from each DASH Food Group

8¼	4¾	5	4	3	1½	2½	0
Grains	Vegetables	Fruits	Dairy	Meats, Fish, and Poultry	Nuts, Seeds, and Legumes	Fats and Oils	Sweets and Added Sugars

BREAKFAST	SODIUM (MG)
1 cup whole grain oat rings:	273
+ 1 medium banana	1
+ 1 cup low-fat milk	107
1 cup fruit yogurt, fat-free, no sugar added	173

LUNCH	SODIUM (MG)
tuna salad sandwich:	
+ ½ cup tuna, drained, rinsed	39
+ 1 Tbsp mayonnaise, low-fat	101
+ 1 large leaf romaine lettuce	1
+ 2 slices tomato	2
+ 2 slices whole wheat bread	299
1 medium apple	1
1 cup low-fat milk	107

DINNER	SODIUM (MG)
⅙ recipe zucchini lasagna	368
salad:	
+ 1 cup fresh spinach leaves	24
+ 1 cup tomato wedges	9
+ 2 Tbsp croutons, seasoned	62
+ 1 Tbsp vinaigrette dressing, reduced calorie	133
+ 1 Tbsp sunflower seeds	0
1 small whole wheat roll:	148
+ 1 tsp soft (tub) margarine	45
1 cup grape juice	8

SNACKS	SODIUM (MG)
½ cup almonds, unsalted	0
¼ cup dry apricots	3
6 whole wheat crackers	166

TOTAL SODIUM (MG) FOR DAY 7	2,069

268 mg less sodium
Try regular oatmeal instead of whole grain oat rings.

203 mg less sodium
Use low-fat, no salt added cottage cheese in zucchini lasagna recipe.

26 mg less sodium
Use unsalted margarine.

132 mg less sodium
Use low-sodium vinaigrette in salad recipe.

Total nutrients per day 1,993 calories, 64g total fat, 29% calories from fat, 13g saturated fat, 6% calories from saturated fat, 71mg cholesterol, 2,065mg sodium, 282g carbohydrate, 92g protein

Appendix E

Activity Log

My Physical Activity Diary

Week: _____ Month: _____

Monday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Tuesday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Wednesday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Thursday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Friday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Saturday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Sunday		
Time of Day	Description of Activity (Type and Intensity Level)	Duration

Notes:

Learn more at https://www.cdc.gov/healthyweight/losing_weight/eating_habits.html

CDC
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Appendix F

Weight Log

PREVENT T2

Weight Log

Your Lifestyle Coach will tell you how much you weigh at each session of Prevent T2. Use this log to record these numbers. It will help you track your progress over time.

Name _____

Today's date	How much I weigh today (pounds)	Today's date	How much I weigh today (pounds)

Appendix G

Water Diary

Appendix H

Post-Survey

SELF-MANAGEMENT OF BLOOD PRESSURE POST-EDUCATION SURVEY

Q1 I understand what it means to have high blood pressure.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q2 I feel comfortable with taking my blood pressure at home.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q3 I feel confident I follow a low sodium diet to prevent increased blood pressure.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q4 I feel confident that I have increased activity at least 20 minutes at least 3 days a week.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○
Q5 I understand how much water intake I should have daily.	Strongly disagree ○	Disagree ○	Agree ○	Strongly Agree ○

Q6

What is one change you have made since the last visit to improve your blood pressure?

_____

Appendix I

Project Tracking Tool

DNP Project on Self Management of Uncontrolled Hypertension																	
Patient	Date of Initial Visit	Gender	Race	Handout Provided?	Verbal Education Provided?	Handout & Education Provided By	BP At Visit	Pre-Survey Completed	Date of Follow-Up Appt (Max 3 month)	Demonstrates Appropriate BP Measurement in Office	Completed Daily BP Log	BP at Visit	Completed Water Diary	Decreased Salt Intake	Completed Activity Log	Post Survey Completed
A																
B																
C																
D																
E																
F																
G																
H																
I																
J																
K																
L																
M																
N																
O																
P																
Q																
R																
S																
T																

U																
V																
W																
X																
Y																
Z																
AA																
BB																
CC																

Appendix J

Project Timeline

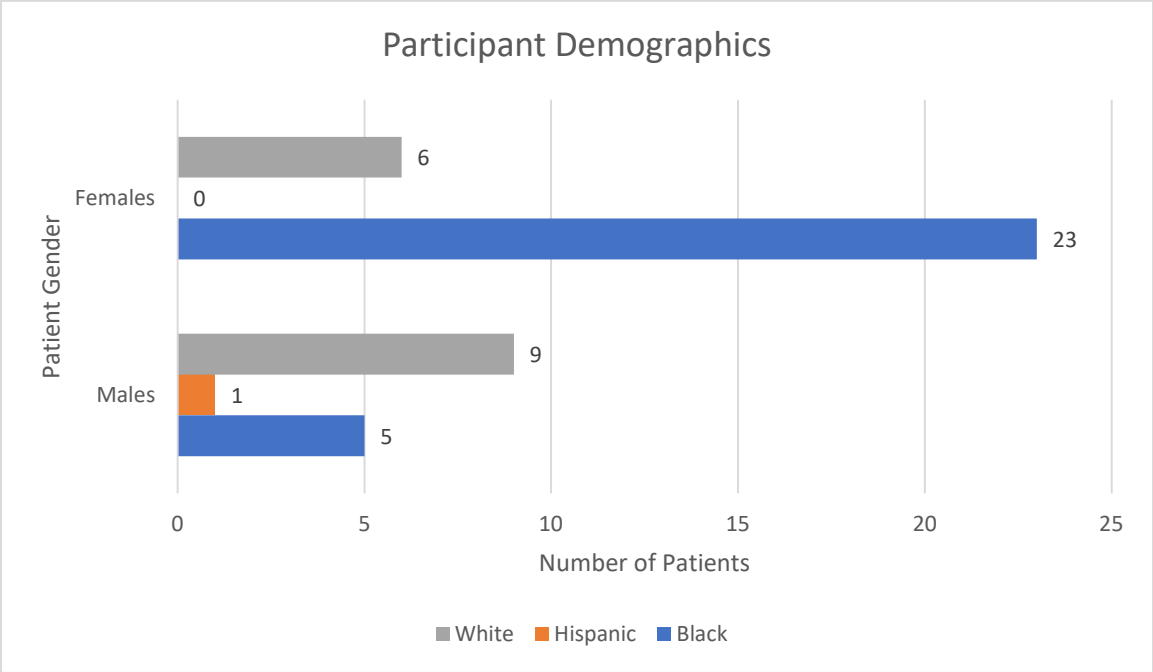
Appendix K

Project Budget

Direct Costs	**Quantity (Number)**	**Unit Costs**	**Total**
I. Project Materials			
Pre and Post Surveys for providers/paper	50	$.02	$1.00
Self-Management Guide	50	$.02	$1.00
DASH Diet	50	$.02	$1.00
Activity Log	50	$.02	$1.00
Weight Log	50	$.02	$1.00
Water Diary	50	$.02	$1.00
Microsoft Office 365	1	$151.99	$151.99
Sub-Total for Direct Costs:			**$157.99**
Indirect Costs	**Quantity (Hrs)**	**Unit Costs**	**Total**
I. Staffing Time			
DO Salary	4	$110.00	$440.00
NP Salary	40	$47.00	$1,880.00
CMA Hourly	22	$14.00	$308.00
MOA Hourly	11	$12.00	$132.00
Admin Salary	10	$40.00	$400.00
Sub-Total for Indirect Costs:			**$3,160.00**
Total (Direct and Indirect Costs)			**$3,317.99**

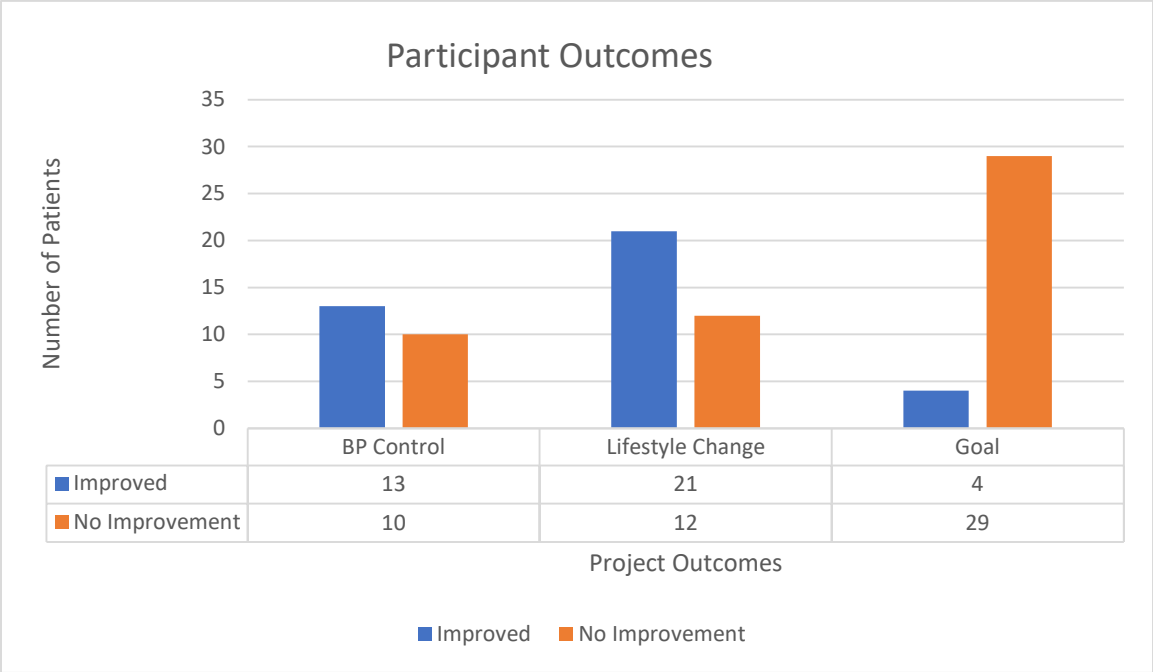
Appendix L

Patient Demographics



Appendix M

Participant Outcomes



Appendix N

Project Poster

ECU COLLEGE OF NURSING

Improving Self-Management in Patients with Uncontrolled Blood Pressure

Brittany E. Hines, MSN, DNP Student, RN, FNP-BC
hinesb21@students.ecu.edu

Background

- Primary care providers are responsible for providing care to patients and managing their health, focusing on education, preventative measures, and forming long-term relationships to promote and encourage healthier lifestyles and better health outcomes.
- Hypertension (high blood pressure) is one of the top contributors to the risk of death worldwide.
- Reducing patients with uncontrolled blood pressure can reduce costs for patients, organizations, and the health care system.

Purpose

- To implement educational tools for patients with uncontrolled blood pressure in a primary care setting to improve self-management and control of blood pressure.

Methodology

- Pre-survey provided at initial office visit for patients to identify goal to achieve by next visit
- Educational handouts and tracking logs provided at initial visit to support self0management of identified goal.
- Post-survey and discussion at follow-up visit to evaluate if goal achieved.
- Patients tracked with anonymous identifier to verify completion and compliance.

Results

- 44 patients were invited to participate at initial visit
- 11 failed to return for follow-up
- 21 patients reported at least **one** lifestyle change at follow-up visit.
- 12 patients reported **no change**
- 13 patients had improved blood pressure

Participant Outcomes

Findings

- Educating patients to self-manage their lifestyle through proper exercise, diet, and compliance improved their overall health, including uncontrolled blood pressure
- Improved blood pressure noted in 13 (30%) of patients at their follow-up visit.

Opportunities

- Stakeholder buy-in within the practice
- Interprofessional collaboration amongst healthcare team.
- Patient compliance
- Early identification of socioeconomic barriers
- Educational materials available in different languages such as Spanish

Implications for Care

- Overall cost reduction to the healthcare system
- Improvement in quality measures, meaningful use, and risk scores for patients
- Improved health and wellbeing to patient population

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