

ADHERENCE TO HYPERTENSION MANAGEMENT RECOMMENDATIONS FOR  
PATIENT FOLLOW-UP CARE AND LIFESTYLE MODIFICATIONS MADE BY  
MILITARY HEALTHCARE PROVIDERS

Timothy J. Collins

APPROVED:

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Virginia K. Saba, PhD., R.N., FAAN., FACMI , Chair Date

---

Quanetta Edwards, Col., BSN, MSN, DNSC-c, Co-Chair Date

---

Cynthia Grandjean, MSN, CRNP, Member Date

APPROVED:

---

F.G. Abdellah, Ed.D., ScD., R.N., FAAN Date

Dean

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## ABSTRACT

The purpose of this study was to describe military healthcare providers' adherence to nationally recognized hypertensive patient guidelines concerning lifestyle modifications and follow-up instructions after an initial diagnosis of hypertension. The importance of monitoring high blood pressure (follow-up) and maintaining blood pressure control was examined. Research has shown that while hypertension follow-up is being performed, physicians are not following established guidelines aggressively enough in identifying situations in which more robust management may be appreciated. Neuman's Systems Model was used as the conceptual framework to guide this study. Data was collected utilizing a checklist developed by the researcher according to national treatment recommendations. Using a descriptive quantitative design, eight research questions were investigated during a retrospective chart review on a convenience sample of 35 medical records at an Air Force medical treatment facility located in the northeast United States. Military Healthcare Providers fared well (94%) in maintaining oversight of their hypertensive patients by providing excellent follow-up management. However, lifestyle modification prescriptions to their patients, were less favorable. There was a low compliance with weight loss instruction (36%), the limitation of alcohol use (57%), and need to increase physical activity (38%), reduce sodium intake (6%), and maintain adequate potassium (3%), calcium (9%), and magnesium (0%). Patients in this study were also not provided with adequate information about decreasing dietary fat (17%). However, Military Healthcare Providers were exceptional in both identifying and counseling cigarette smokers (100%). This thesis revealed a better compliance to JNC VI (1997) guidelines by Advanced Nurse Practitioners than physicians did in all areas of instructions. Advanced Nurse Practitioners lead the way for physicians in dietary instructions, weight loss instructions, and Health and Wellness Center referrals.

Key words: hypertension lifestyle modification follow-up teaching blood pressure

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by

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THESIS

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## PREFACE

This research was conducted to provide information about military healthcare providers adherence to nationally recognized hypertensive patient guidelines concerning lifestyle modifications and follow-up instruction after an initial diagnosis of hypertension. It was designed to provide information for a population in which there is very little published research and to add to the current body of knowledge.

## DEDICATION

Upon completion of yet another scholastic work, I have reason to pause, to contemplate, and reflect on my life's treasures. I am proud to dedicate this thesis to all of those individuals throughout my life who have inspired, cajoled, and encouraged me in both my personal and professional life. I am so very proud to number all of you as my greatest asset.

To my wife Theresa, thank you for daring me to apply for this program. For without your gentle nudge, I would not be penning this dedication now.

To my parents, Marilyn Cecil Scott Collins and the late Lorne E. Collins, thank you for teaching and demonstrating to me that one need to follow only one guideline to succeed in life, The Golden Rule. This lesson has always made a difference to me.

To my family members, Michael, Sandra, Patricia, Kathleen, Daniel, Terrence, Maureen and James, you have made me feel special and part of your lives even though I have been miles away for the most of my adult life. I am at home in your presence.

To my classmates, thank you for all the teaching and support. I have learned valuable lessons from each one of you that will benefit others and myself.

Finally, to my greatest treasures, Lauren and Hayley Collins, my English roses. Now, after two master degrees and travel all over the world, I offer you the greatest advice I have ever received. Do unto others, as you would have others do unto you. I love you.

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## CHAPTER I: INTRODUCTION

Background/Problem Statement

Hypertension affects an estimated 50 to 60 million Americans. In the United States, the annual death rate attributed to hypertension is over 37,000 (American Heart Association, AHA, 1995). Hypertension is identified as a leading risk factor for the development of coronary artery disease, congestive heart failure, stroke, ruptured aortic aneurysm, and retinopathy (Preventive Services Task Force, PSTF, 1996). Coronary atherosclerotic heart disease itself has been identified as the most common cause of morbidity and mortality in the United States (Massie & Amidon, 1998). The PSTF acknowledges that this plague of heart disease recruits a legion of more than 740,000 Americans to its army of death annually. Additionally, hypertension has a significant impact on African-American populations, where hypertension is nearly 40 per cent greater than in whites (approximately 6.4 million African-Americans have high blood pressure), and the consequences are more severe and frequent (Office of Disease Prevention and Health Promotion, ODPHS, 1998a). Similarly, stroke has shown to have an increased mortality rate. Stroke is the third leading cause of death in the United States, and is responsible for an estimated 150,000 deaths per year (PSTF, 1996). According to *The Sixth Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure*, JNC VI, (1997), in the United States alone, the financial burden for treating heart disease and stroke, is more than 259 billion dollars.

Tragically, many individuals suffering from hypertension are unaware this silent threat is causing damage. The disease may go undetected for years, and when people are finally evaluated, this untreated disease may be severe. The premature development of coronary heart disease, cardiovascular disease, diabetes mellitus, and the end-stage renal disease outcomes attributed to hypertension alone, particularly in African-Americans, and the elderly, have increased yearly, creating a significant public health problem (ODPHS, 1998b; JNC VI, 1997). Fortunately, this deadly illness can easily be detected with

routine screening. It has been proven that early detection and treatment reduce morbidity and mortality (Schumann & Emerson, 1998).

According to the National Heart, Lung, and Blood Institute, who have provided guidelines for the treatment of hypertension, current treatment modalities for hypertension are extremely effective (Rose, 1998). It is therefore essential that individuals, afflicted with hypertension be properly screened and treated prior to debilitating effects. Hypertension has traditionally been defined as a systolic blood pressure greater than 140 mmHg, and/or diastolic blood pressure 90 mmHg or greater (ODPHS, 1998a). In addition, national guidelines established by the JNC VI (1997) provide a useful tool that can be adapted and implemented for the treatment of hypertension. This committee used evidence-based research to provide contemporary approaches to hypertension control, and further classified a high normal blood pressure with hypertension in three stages (see Table 1).

**Table 1****Adult Classification of Hypertension**


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Category	Systolic Blood Pressure	Diastolic Blood Pressure
High Normal Hypertension	130-139 mm Hg	85-89 mm Hg
Stage 1	140-159 mm Hg	90-99 mm Hg
Stage 2	160-179 mm Hg	100-109 mm Hg
Stage 3	≥ 180 mm Hg	≥ 110 mm Hg

---

Source: JNC VI, 1997

Recently, the Joint Chiefs of Staff developed a conceptual framework for 21st Century joint military operations entitled *Joint Vision 2010* (Brundage, 1998). Two objectives of the joint health services heavily address preventive medicine and medical surveillance capabilities. The objectives emphasize that early detection, health assessment, and treatment of health diminishing conditions enhance health. To achieve joint health service objectives, unit commanders should initiate programs to ensure compliance with medical screening tests, physical and dental examinations, and individual health risk assessments.

With the implementation of the Armed Forces initiative, TRICARE, the 1998 United States Air Force Surgeon General Lt. General Charles H. Roadman II stressed that the Air Force build healthy communities by changing its focus primarily from disease intervention alone to disease identification. Lt. General Roadman found that this would not only preserve military strength, but also result in significant financial savings (Kersgard, 1998).

The concept of stressing the importance of disease identification reflects current Air Force beliefs. The Air Force has initiated the policy of Put Prevention into Practice (PIIP). The PIIP initiative is the basis for one of the Air Force's Four Pillars. These Pillars are the four top priorities of the U.S. Air Force Medical Services. They are (a) ensure medical readiness, (b) deploy TRICARE, (c) to right size, and (d) build healthy communities. This is where PIIP is greatly highlighted (True, 1998). The building of healthy communities pillar represents the greatest opportunity for healthcare providers to educate the military beneficiaries and their families. This educational opportunity will benefit not only healthcare delivery, but also decrease the morbidity and mortality numbers of the society it is serving.

With the significant down sizing or right sizing of the U.S. Air Force, it has become essential that limited resources, both medical and personnel be maximized. Health promotion maximizes both limited personnel and medical resources by identifying, educating, and reducing the risk for disease. Prevention will increase military readiness by assuring that personnel are physically capable of accomplishing their military tasks.

Clinical care is credited to effectively prevent disease, either by detecting illness, asymptomatic disease, or disease risk factors at an early, more treatable stage (ODPHS, 1998a). Without prevention, the hypertension issue would be unsolvable and would depend on treatment of existing high blood pressure. Disease identification grants an opportunity to interrupt and prevent the vicious, expensive, cyclical action of managing high blood pressure and its deleterious complications. The JNC VI (1997) recommendation (a) classified blood pressure (hypertension), (b) determined follow-up schedules, (c) identified cardiovascular risks, (d) specified treatment strategies, (e) suggested dietary recommendations, and (f) discussed lifestyle modifications and



medication therapy.

Although the JNC VI (1997) guidelines incorporate six recommendations, this study focused primarily on hypertension management. Two aspects examined were lifestyle modification and the monitoring of blood pressure to ensure adequacy of treatment (follow-up). Education on lifestyle modification equips the patient population with an intervention that can aid in the reduction of hypertension induced cardiovascular risk factors. This benefit can be attained with little or minimal risk to patients. Regardless, if lifestyle modifications alone are unable to control hypertension, they can still have the positive effect of reducing the number and dosage of anti-hypertensive medications required to manage the condition.

The application of lifestyle modification is a suitable and necessary treatment for all patients diagnosed with hypertension. Lifestyle modifications include weight and dietary management, exercise, and smoking and alcohol avoidance. According to the JNC VI (1997): (a) a weight loss of only ten pounds reduces blood pressure in a large portion of overweight people, (b) moderation of alcohol intake ameliorates hypertensive risk factors, (c) a moderate aerobic exercise program has proven positive effects on blood pressure reduction, (d) small modifications in dietary habits, such as reducing sodium and dietary fat intake, increasing potassium, calcium, and magnesium intake demonstrated evidence of benefiting and attenuates hypertension and (e) avoiding smoking has a significant impact on hypertension. It has been found that smokers have a threefold to fivefold higher risk of coronary death than nonsmokers.

In addition to lifestyle modifications, monitoring blood pressure in patient progress (follow-up) is of great importance. It has been shown that unchecked hypertension has dangerous and possibly fatal consequences (AHA, 1995). Berlowitz et al. (1998) pointed out that while, indeed, hypertension follow-up is being performed, physicians are not

following JNC VI (1997) guidelines aggressively enough in identifying situations in which a more vigorous management approach may be beneficial.

Air Force Health Care Providers must take every opportunity to promote wellness and provide preventive services. This will result in an increased availability of a duty ready force. A healthy force will enable the U.S. Air Force to execute its responsibility, that is: To Fight and Win .

#### Purpose of the Study

The purpose of this study was to describe whether military healthcare providers adhere to *The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*, JNC VI (1997) Hypertensive patient guidelines. This study focused its attention on lifestyle modifications and provision of follow-up instructions after an initial diagnosis of hypertension as documented in the medical record, in one midsize Air Force Treatment Facility.

This study examined the importance of monitoring high blood pressure (follow-up) and maintaining blood pressure control. Follow-up visits are important for the encouragement of the previously addressed lifestyle modifications and for providers to make possible medication adjustment. The education and communication of healthy lifestyles from healthcare provider to patient allows the patient to become an active participant in his/her own well being rather than merely a passive spectator and recipient of care.

This study specifically explored the hypertension management recommendations for follow-up care and lifestyle modifications made by healthcare providers in one midsize Air Force Treatment Facility. This study addressed areas of prevention, and identified where further evaluation is needed. It is hoped that the data obtained from this study will be of educational value for Air Force Health Care Providers as to the

significance of preventive practice of hypertension management and blood pressure monitoring (follow-up).

#### The Research Question

To what extent do Military Healthcare Providers adhere to recommendations for hypertension management provided by *The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure Guidelines* (JNC VI, 1997) concerning: (a) Lifestyle modifications and (b) Blood pressure monitoring (follow-up) recommendations? More specifically, the research questions address lifestyle modifications and blood pressure management pertaining to the following:

1. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding weight loss, if overweight (overweight is a body mass index [i.e. weight in kilograms divided by height in meters square]) of 27 or greater?
2. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding limiting alcohol intake to no more than 1 ounce (30 mls) of ethanol? (This equals 24 ounces of beer or 2 ounces (60 mls) of 100 proof whiskey per day or 0.5 ounces (15 mls) of ethanol per day for women and lighter weight people).
3. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding increasing aerobic physical activity (30-45 minutes, 4 days of the week)?
4. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding reducing sodium intake to no more than 100 mmol/day (2.4 grams of sodium or 6 grams of sodium chloride)?
5. To what extent do Military Healthcare Providers adhere to the JNC VI

recommendations regarding maintaining adequate intake of dietary potassium (approximately 90 mmol/day)?

6. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding maintaining adequate intake of dietary calcium and magnesium for general health?
7. To what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding smoking cessation and reducing intake of dietary saturated fat and cholesterol for overall cardiovascular health?

Blood pressure monitoring (follow-up) recommendations are outlined in Table 2:

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**Table 2**  
**Follow-up Recommendations for Hypertension**

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<b>Systolic</b>	<b>Diastolic</b>	
130-139mm Hg	85-89mm Hg	Recheck within 1 year
140-159mm Hg	90-99mm Hg	Confirm within 2 months
160-179mm Hg	100-109mm Hg	Evaluate or refer to source of care within 1 month
≥ 180mm Hg	≥ 110mm Hg	Evaluate or refer to source of care immediately or within 1 week, depending on clinical situation

---

Source: JNC VI, 1997

### Conceptual Framework

The conceptual framework refers to the use of related concepts that provide a foundation for the problem under study and support the rationale for conducting the study. The conceptual framework selected for this study is the Neuman Health-Care Systems Model (Neuman, 1998). Neuman describes the complex interrelationship of four essential concepts of nursing's metaparadigm: (a) nursing, (b) person, (c) health, and

(d) environment. Nursing is a concept that incorporates actions to assist individuals, families and groups to maintain a maximum level of wellness. The primary aim is stability of the patient/client system, through nursing interventions to reduce stressors.

The patient/client system, whether in a state of wellness or illness, is a dynamic composite of the interrelationship of five variables or factors: physical, psychological, socio-cultural, developmental, and spiritual. Neuman (1998) describes three levels of prevention applied to the patient/client system: (a) primary, (b) secondary, and (c) tertiary prevention. (It should be pointed out that while all of Neuman's levels of prevention will be explained, this research draws its attention to tertiary prevention). Primary prevention relates to general knowledge that is applied in a client assessment and intervention in identification and reduction of risk factors associated with environmental stressors to prevent disequilibrium. Secondary prevention relates to symptomatology following a reaction to stressors, appropriate ranking of intervention priorities, and treatment to reduce their noxious effects. Finally, tertiary prevention concentrates on the readjustment toward optimal patient stability. The paramount goal is to increase the resistance to identified stressors or decrease stressors to help prevent reoccurrence of illness. This process moves the client back in a circular manner toward primary prevention.

Concepts addressed by Neuman (1998) are components of the healthcare provider's scope of practice. While Neuman addresses the nurse as an important person in providing primary, secondary, and tertiary prevention, for the purpose of this study, all credentialed healthcare providers will be assessed in promoting tertiary prevention for patients with hypertension.

In this study, the concepts of Neuman's (1998) model were used to guide this author in his critical thinking. In relation to Neuman's model, a diagnosis of hypertension and recommendations for lifestyle modifications, may impose additional

stressors in individuals identified with this serious disease. The military healthcare provider is responsible for assessing, diagnosing, planning, intervening and evaluating clients problems and their stressors. The concepts of planning and intervening were examined in this study by military healthcare providers documentation of prescribed hypertension lifestyle modifications in accordance with JNC VI (1997) hypertension guidelines. Neuman (1998) emphasizes that nursing s broad perspective encompasses all potential stressors, and thus is ideal for utilization in primary care. The Military Healthcare Provider is able to intervene at each of the three levels of prevention by strengthening the client s line of defense through:

1. Educating and counseling patients/families on disease and health lifestyles
2. Providing education and health promotion in all relevant plans.
3. Collaborating practice with other healthcare providers (Schuler & Huebscher, 1998).

The above functions were assessed in this study through an evaluation of healthcare providers adherence of JNC VI (1997) guidelines to restore hypertension patients to their optimal level of health.

The military health care system, in agreement with Neuman (1998), sees prevention as intervention (Brundage, 1998). Actions to enable the client to retain, attain or maintain system stability begin when the stressor is either suspected or identified, and subsequent actions are based on possible or actual degrees of reaction, resources, goals, and anticipated outcomes.

For the purpose of this study, concepts of Neuman s (1998) model provided information to patients diagnosed with hypertension in order to assist them toward restoring their health and optimal stability. This is the goal of tertiary prevention. By adhering to lifestyle modifications, the patient with hypertension will avoid or allay

stressors and promote a stronger line of defense against disequilibrium. This line of defense will aid in the reduction of morbidity and mortality associated with hypertension. In this study, credentialed healthcare providers, to include nurse practitioners, played a significant role in tertiary prevention. They provided patients with hypertension information on lifestyle modifications to promote optimal stability in their disease.

Tertiary prevention is an important concern for military healthcare in peacetime and in operational environments. Dr. James Zimble (1999), President of the Uniformed Services University of the Health Sciences stated at the October 30, 1995 AMSUS annual meeting:

The main purpose of medical support is to conserve combat power. Chief among the common features of modern military medicine is an emphasis on prevention. It is essential that the military experts focus be on disease prevention and health promotion anywhere that troops might be deployed. Military medicine involves prevention, diagnosis, and treatment by medical personnel who are integrated in to the operations they support (p. 185).

Disease prevention is a key goal of the Neuman Systems Model (1998). It is also a primary goal of military medical readiness to ensure personnel are world-wide qualified for deployment. It is crucial healthcare providers prevent disease, non-battle injuries and maintain a healthy deployment force. Due to the reduction in numbers of personnel and the increase in worldwide humanitarian missions, the deployment of military personnel is inevitable. Healthy Airmen will therefore deploy physically able, fit men and women



prepared to encounter foreseeable threats (Brundage, 1998). Healthcare for the military is not confined only to active duty personnel. Maintaining a healthy military community encompasses service to retirees, military dependents and family members.

#### Definition of Relevant Terms

For the purpose of this study the following terms were operationally and conceptually defined:

Military health care provider (MHCP). Credentialed providers of healthcare who assess, diagnose, and treat patients in a variety of healthcare settings.

Military. All branches of the United States Armed Forces.

Hypertension. Systolic blood pressure of 140 mm Hg or greater; diastolic blood pressure 90 mm hg or greater; or taking antihypertensive medication for blood pressure control (JNC VI, 1997).

Lifestyle modifications. Lifestyle modification instructions should be given for all individuals with a diagnosis of high normal hypertension (i.e. systolic blood pressure 130-139 or higher, and diastolic blood pressure 85-89 or higher) or greater. The following are instruction criteria:

1. Lose weight, if overweight (overweight is body mass index [i.e. weight in kilograms divided by height in meters square] )of 27 or greater
2. Limit alcohol intake to no more than one ounce (30 mls) of ethanol. This correlates to 24 ounces of beer or 2 ounces (60 mls) or 100 proof whiskey, per day or 0.5 ounces (15 mls) of ethanol per day for women and lighter weight people
3. Increase aerobic physical activity (30-45 minutes most days of the week)
4. Reduce sodium intake to no more than 100 mmol/day (2.4 grams of sodium or 6 grams of sodium chloride)

5. Maintain adequate intake of dietary potassium (approximately 90 mmol/day)
6. Maintain adequate intake of dietary calcium and magnesium for general health
7. Stop smoking and reduce intake of dietary saturated fat and cholesterol for overall cardiovascular health

Monitoring of blood pressure (follow-up) recommendations: For further explanation and graphic representation, see Table 2.

#### Limitations

The sample is specifically limited to military beneficiaries of all races, 40 years of age and older. Participants were selected from one midsize Air Force Medical Treatment Facility. Findings are limited because they are based on a limited population at one site. There is also a limitation that the finding of adherence to guidelines is drawn solely from the documentation in the clinical record. The sample was a convenience sample limited to patients with a pre-existing diagnosis of hypertension and thus cannot be generalized to larger populations.

#### Assumptions

It is well documented and accepted that hypertension is a leading risk factor in the development of coronary artery disease, congestive heart failure, stroke, ruptured aortic aneurysm, retinopathy, and kidney disease. Therefore, proper management of this dangerous malady will reduce the risk for the above stated conditions. To that end, this study is based on the following two assumptions: (a) Healthcare providers are knowledgeable about the current standards for the management of hypertension, and (b) Proper documentation of recommendations are noted in the patient's chart.

The 1997 JNC VI hypertension guidelines provided an excellent evidence based hypertension management guide. This publication equips all health care providers with

the tools needed to administer continuity of care to the hypertensive patient in a proven, measurable and rational manner.

### Summary

It is widely accepted by medical providers that incorporating preventive care is essential to quality practice. However, according to *The Clinician's Handbook of Preventive Services* (ODPHS, 1998a), the delivery of these preventive services, even those services that all authorities agree upon, is far from satisfactory. Not only is the delivery of preventive services an absolute necessity, but the accurate documentation of care rendered is a hallmark used to rate the performance of providers, their practices, and health plans.

The purpose of this study was to determine whether military healthcare providers in one midsize Air Force facility are making recommendations to their hypertensive (systolic blood pressure 130-139 or higher, and diastolic blood pressure 85-89 or higher) patients concerning lifestyle modifications, and giving appropriate follow-up instructions after an initial diagnosis of hypertension as described by JNC VI (1997). Military beneficiaries age 40 and over, who have previously been identified and diagnosed as hypertensive, were selected for this study. Members of this age group are at an optimal point where a baseline preventive measurement can be obtained. The variable of race is included because individuals of specific ethnicity are predisposed to hypertensive disease. The goal of this study was to describe Military Healthcare Providers adherence to hypertension guidelines according to JNC VI standards. This will be useful to increase health care provider awareness of preventive measures, thereby optimizing the healthcare of service personnel. It is hoped that the information generated from this small study will have positive effects on health care providers and their adherence to preventive measures and encourage them to include recognized preventive hypertension screening in their

practice.

## CHAPTER II: REVIEW OF THE LITERATURE

### Review of the Literature

The purpose of this study was to determine whether military healthcare providers in one midsize Air Force facility are making recommendations to their hypertensive (systolic blood pressure 130-139 or higher, and diastolic blood pressure 85-89 or higher) patients concerning lifestyle modifications, and giving appropriate follow-up instructions after an initial diagnosis of hypertension as described by JNC VI (1997). The focus of this chapter is to provide an overview of theoretical and empirical studies regarding the management of hypertension (follow-up) and lifestyle modification prescription in accordance to JNC VI guidelines. Specific empirical studies pertaining to diet, exercise, and smoking avoidance and its impact on hypertension will be discussed.

The information available concerning the treatment of hypertension is vast and all encompassing. This review of the literature will address a short history of *The Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC VI, 1997) and the rationale of why it is the primary source of information in this research proposal. This study particularly focused its literature review on published hypertension lifestyle modification and follow-up investigations.

#### Theoretical Studies: Hypertension Guidelines

The sole purpose of the hypertension guidelines (JNC VI, 1997) is to provide clinical guidance in the treatment of hypertension to the primary care practitioner. The National High Blood Pressure Education Program (NHBPEP) which has a coordinating committee consisting of representatives from 38 national professions and seven federal agencies determined the need for the JNC VI report.

The hypertension guidelines (JNC VI, 1997) panel was coordinated by an executive

committee composed of nine individuals. Contributions were obtained from medical disciplinary experts from medicine, nursing, nutrition, pharmacy, and public health. These contributions were later assembled, reviewed, condensed and edited by the committee.

Recommendations concerning the therapies for hypertension are derived from evidenced-based practice. The sources for this information were obtained from meta-analyses, random controlled trials, retrospective analyses, cohort studies, cross-sectional population studies, position statements and non-randomized clinical interventions. The JNC VI (1997) data was obtained primarily from random clinical trials. Intervention drawn from random clinical trials has been shown to reduce the incidence of untoward clinical occurrences.

The topics covered by JNC VI (1997) hypertension guidelines include preventing high blood pressure by improving lifestyles, the cost of treatment, the use of blood pressure self-measurement, how managed care affects the treatment of hypertension, and new medication therapy. Most importantly, and the focal point of this research paper, is the committee's strong recommendation for lifestyle modification preventing hypertension or its exacerbation. These modifications can be the definitive therapy for some individuals as well as adjunctive therapy for persons with hypertension.

The hypertension guidelines (JNC VI, 1997) furnishes healthcare providers with nationally recognized guidelines that direct caregivers toward the proper path in treatment modalities for the hypertensive individual. With these guidelines, the practitioner can be reassured that he/she is providing and following the standard of care that is appropriate.

#### Empirical Studies: Healthcare Providers Implementation of Lifestyle Modification

Although it is important, very few studies have been conducted concerning

physicians or other healthcare providers responsibility toward lifestyle modification adherence. Greenwood et al. (1995) found that only 5% of inpatients with high risk for cardiovascular disease were assessed for lifestyle modification. Through the Clinical Quality Improvement Network (CQIN) Investigators, Greenwood, et al. examined the patterns of investigation and treatment of blood lipid levels, in addition to modifiable risk factors for atherogenesis. The atherosclerotic risk factors were defined as (a) current history of smoking or drinking, (b) sedentary lifestyle, (c) current or remote hypertension, (d) dyslipidemia, and (e) a positive family history of atherosclerotic heart disease. The authors further defined hypertension as a documented history of hypertension or treatment with an oral anti-hypertensive medication. Dyslipidemia was also defined as any record of a serum lipid abnormality.

Greenwood et al. (1995) data were obtained from retrospective review of the inpatient records of 3,304 hospitalized patients. Results showed only 28% of patients had lipid measurements recorded during their hospital stay. Lipid lowering diet and medications were prescribed for 22% and 8% of all patients, respectively. Adjustments in lifestyle was recommended for only 5% ( $p < 0.01$ ). The study concluded by stating that high risk patients in an acute care setting have a low incidence of lipid assessment, and an even lower rate of lipid and lifestyle modification therapies.

Stafford, Moss, and Petkun (1998) discovered that only 13% of physicians studied believed facilitating lifestyle modification was important. The study examined physician satisfaction with, and their perceived role in, lifestyle changes and medication compliance. These authors surveyed 225 U.S. physicians (75 cardiologist, 75 internists, and 75 general/family practitioners) with a structured hypertension treatment questionnaire. They looked at physician satisfaction concerning availability and effectiveness of medication therapy and lifestyle modification programs, and also patients

willingness to accept therapy, using compliance scales (0 = very dissatisfied, 10 = very satisfied). Physician attitudes toward their role with patients concerning medication and lifestyle modification compliance were categorized into three groups: (a) physician is responsible for facilitating change, (b) physician educates; patient is responsible for changes, (c) physician does not have a significant role; patients with their ability and interest to change will do so themselves. Results showed physicians were more satisfied with use of medication therapy than with recommendations for lifestyle modification in hypertension management. Most physicians visualized themselves as facilitating medication compliance (34%), rather than encouraging lifestyle changes (13%). However, the majority of these physicians saw their role more as educators than facilitators (65% vs 86% respectively).

Stafford, Moss, and Petkun (1998) concluded that physicians are more satisfied with pharmacological control of hypertension than with rate of lifestyle modification in treatment of hypertension. The researchers stressed that physicians see themselves more as educators than as facilitators of patient compliance with lifestyle modifications. These results, the authors emphasized, could limit the physicians ability to dramatically improve the percentage of patients with controlled blood pressure.

### Smoking Studies

It should be no surprise to anyone on the dawn of the new millennium that cigarette smoking is extremely bad for one's health. Nieman (1998) found that cigarette smoking almost always begins in the adolescent years. Estimates are that one million youngsters will take up smoking each year. During their lifetime, this adds up to about \$10 billion to the cost of healthcare in the United States. Adults are quitting in record numbers. Almost half of those who considered themselves ever a smoker, now consider themselves former smokers. Nieman further stresses that most smokers confess that



giving up this addiction is extremely difficult. This may explain why there are more than 46 million Americans still smoking.

Cigarette smoking effects blood pressure. Mundal, Huemdahland and Gjesdal, (1998) found that cigarette smoking induces a mild platelet release reaction and also stimulates the release of epinephrine in hypertensive men compared to a normotensive control group. Koch and Biendra (1996) discovered that the possible mechanisms for hypertension include nicotine-induced central and peripheral sympathetic nervous system stimulation because of incomplete metabolism of nicotine. This process releases vasopressin with chemoreceptor stimulation, which in turn damages the vessel walls. The result may contribute to the overall increase in cardiovascular risk for smokers. Smoking also increases heart size as Verdecchia et al. (1995) observed. This study pointed out that smokers have greater left ventricular mass than do nonsmokers. Results show heavy smokers have a rise in whole day blood pressure over those who do not smoke.

### Diet Studies

The effect of dietary fat intake has long been associated with heart disease. High blood cholesterol is a serious problem. Nieman (1998) found that despite a drastic drop from the 1960s, 20% of Americans still have high cholesterol levels, and 31% have borderline high levels. Many levels can be controlled with diet alone, and thus reduce blood pressure. In a literature review of 84 articles on cholesterol, Kuller (1997) concluded that high fat intake is a major cause for hypertension. Therefore, a decrease in the fat intake in the diet of Americans will reduce United States mortality and morbidity significantly. In a study to determine whether fat intake may be a risk factor for hypertension, Beegon and Singh (1997) showed that saturated fat intake was strongly associated with hypertension. Beegon and Singh particularly stressed that higher

saturated fats were a significant determinant for hypertension development.

Sodium consumption has long been associated with hypertension. The Trials of Hypertension Prevention Collaborative Research Group, Phase II (TOHPH II, 1997) has found that high normal blood pressure can be reduced with sodium reduction. The JNC VI guidelines on sodium reduction has been reinforced in several studies, such as Weinberger (1997), Beard, Blizzard, O'Brien, and Dwyer (1997) and Messerli, Schnieder and Weir (1997). All of whose findings support the international consensus that the risk of hypertension is lower when salt intake is lower.

Potassium, magnesium and calcium electrolytes also have a significant effect on the blood pressure. Berri and Wingo (1997) explain that potassium has an antihypertensive effect. The researchers discussed that an increased potassium intake appears to enhance natriuresis, modulate baroreflex sensitivity, direct vasodilatation and decrease cardiovascular reactivity to norepinephrine and angiotensin II, thereby decreasing blood pressure.

Research suggests that these electrolytes have a powerful synergistic effect on hypertension rather than by working individually. In a literature review concerning these dietary electrolytes, McCarron (1997) found that when adults meet or exceed the recommended dietary allowances of calcium, potassium and magnesium, that these minerals protect against salt sensitivity hypertension. The combination of potassium and magnesium supplementation was shown by Summanen, Vuorela and Hiltunen (1994) to have a statistically significant effect on decreasing systolic blood pressure. Research conducted by Ascherio et al. (1996) found that fiber rich foods and magnesium retained significant inverse association with both systolic and diastolic blood pressure.

### Exercise Studies

Hypertension and the lifestyle modifications of weight reduction and physical

activity seem to have a hand and glove relationship. Studies now show, *Trials of Hypertension Prevention Collaborative Research Group. Effect of weight loss and sodium reduction intervention on blood pressure and hypertension incidence in overweight people with high normal blood pressure: The Trials of Hypertension Prevention, phase II*, (TOHP II, 1997), and Nieman (1998) that a losing 5-10 pounds can decrease the diastolic blood pressure by 5mm Hg. A loss of 20 pounds or more doubles the improvement. Being overweight more than triples the risk of developing hypertension. Studies such as Whelton et al. (1998), Wheaton et al. (1997), Jones (1996), and McCarren and Reusser (1996) found that weight reduction provides an effective way to treat and prevent hypertension. Haung et al. (1998) revealed that not only did weight reduction decrease the risk of hypertension, but weight gain increased the risk for hypertension development.

Regular exercise has been shown to be a powerful tool in the prevention and treatment of hypertension. Neiman (1998) reveals that mild hypertension can result in a systolic blood pressure drop of 8-10mm Hg and a 6-10mm Hg fall in diastolic blood pressure, respectively, in people who participate in regular aerobic activity. These beliefs are echoed by Hsieh, Yoshinaga, Muto and Sakurai (1998) who found that individuals who engage in regular physical activity (i.e. three days a week) appear to have the fewer coronary artery disease risk factors than sedentary people.

When combining weight loss and exercise, Little and Margetts (1996) performed a meta-analysis of 122 references and found that diet and exercise are important in etiology and treatment of hypertension in the primary care arena. However, even though both diet and exercise are important for the treatment of hypertension, Gordon, Scott and Levine (1997) discovered that the effects of exercise training and diet induced weight loss are not additive. They relate that this discovery has important healthcare

implications for millions of overweight people with hypertension.

#### Alcohol Studies

When examining the literature for the relationship between alcohol and hypertension this writer did not find a mixed drink but a mixed bag of information; thus study results are conflicting. Itoh et al. (1997) found that reported heavy alcohol intake showed a positive correlation with hypertension for Japanese men who exhibited a skin flush response to alcohol. In a longitudinal study of African-Americans, Curtis, James, Strogatz, Raghunathan and Harlow (1997) found that one could significantly reduce blood pressure by changing drinking habits. An increase in systolic blood pressure was found in African-Americans who continued to consume alcohol. These researchers further discovered that the blood pressure for people who discontinued drinking was comparable to those who abstained from drinking. Jerez and Coviello (1998) demonstrated a weak but significant relationship between quantity/frequency index and diastolic blood pressure. They further noticed a prevalence of hypertension in male drinkers. However, these studies conflict with Cushman et al. (1998) who conducted the *Prevention and Treatment of Hypertension Study (PATHS): Effects of an Alcohol Treatment Program on Blood Pressure*. These researchers concluded that their data did not provide support for reducing alcohol intake in nondependent moderate drinkers as a sole method for prevention and treatment of hypertension.

#### Follow-up Studies

The importance of follow-up in the hypertensive individual has been previously stated and is self-evident. Uncontrolled hypertension is a killer. According to the American Heart Association (1995), hypertension affects 50 to 60 million Americans. The Preventive Services Task Force (1996) identified hypertension as a leading risk factor for the development of coronary artery disease, congestive heart failure, stroke,

ruptured aortic aneurysm, and retinopathy. These grim statistics cannot be reiterated too strongly. The tragedy is that, according to Greenwood et al. (1995), is that only 5% of inpatients with high risk for cardiovascular disease were assessed for lifestyle modification. Likewise, Bernard, Townsend and Sylvestri (1998) discovered that only 24% of patients with hypertension are adequately treated. These studies are buttressed by Berlowitz et al. (1998), who pointed out that while indeed hypertension follow-up is being performed, physicians are not following JNC VI (1997) guidelines aggressively enough in identifying situations in which more robust management may be appreciated.

To summarize, the studies available concerning the lifestyle modification and follow-up recommendations for the hypertensive individual are numerous and supportive of JNC VI (1997). There is much evidence to support tertiary prevention in the arena of blood pressure management. Practitioners should provide this preventive care, education, and guidance with the knowledge that the instruction given to the client is well documented and research based.

### Summary

The literature clearly shows that the recommendations expressed in the hypertension guidelines (JNC VI, 1997) concerning lifestyle modifications and follow-up practices of the hypertensive patient is supported by scientific research. The literature also supports that healthcare practitioners must implement these recommendations in their daily practices when treating hypertension. The adherence to the nationally recognized hypertension guidelines will not only benefit the healthcare practitioner's clients but the well being of society in general.

In closing, one may ponder if any small change in blood pressure accomplished by

life style modification would be of significant benefit to the patient. According to Cook et al. (1995) a small reduction of 2mmHg in diastolic blood pressure would result in a 19 percent decrease in the prevalence of hypertension as well as a 6 percent reduction in the risk of coronary heart disease and a 15 percent reduction in stroke and TIAs. A population-based intervention to existing levels of hypertension treatment could prevent an estimated 67,000 coronary heart disease events, and 34,000 strokes and TIAs annually among those aged 35-64 in the United States.

## CHAPTER III: METHODS

### Research Design and Procedures

This study used a descriptive quantitative design to measure healthcare providers adherence to hypertension guidelines (JNC VI, 1997) in the management of hypertension (follow-up) and lifestyle modification recommendations for patients with the diagnosis of hypertension. Data collected was obtained from a convenience sample of hypertensive patient records utilizing a checklist (See Appendix A) developed by the researcher according to treatment recommendations. Data was gathered retrospectively from chart reviews of documented medical care provided for the hypertensive client. All data collection was performed over a two-day period in December 1999. The medical records were reviewed and maintained within the medical facility. After data collection, the medical records were returned to the medical record section. A total sample of 35 medical records was obtained to assess healthcare providers adherence to hypertension guidelines. This chapter further focuses on sampling procedures, setting, measurement of data, utilization of a pilot study, protection of human subjects, and data analysis.

### Sample

Patients medical records with the diagnosis of hypertension within an Air Force medical treatment facility, which met the established documentation inclusion criteria, were eligible for the study. Inclusion criteria consisted of any adult male or female, 40 years of age or greater, with a pre-existing diagnosis of hypertension (B/P  $\geq$  140/90 mm Hg). The hypertension guidelines (JNC VI, 1997) defines hypertension as a systolic blood pressure of 140 mm Hg or greater, diastolic blood pressure of 90 mm Hg or greater, or taking any antihypertensive medications for hypertension (p. 2417). Only those records of patients diagnosed with hypertension that have been documented by a credentialed provider (i.e. MD, PA, or NP) were included in this study. Exclusion

criteria included pregnant women with hypertension, those less than 40 years of age, and non-beneficiaries of military healthcare. Hypertension in this category of patient is very often transient and requires hypertension management beyond the scope of this study.

#### Setting

Medical records that were included in this sample were selected from a convenience sample obtained from a master list of hypertensive patients provided by an Air Force Medical Treatment Facility computer system that tabulated diagnoses. The charts reviewed were selected from patient care clinics at a midsize Air Force medical center in the northeastern United States. These clinics were chosen due to the high volume of eligible records to survey. The first 30 eligible records that were present were included in this study due to convenience and time constraints of the researcher. Each record selected was audited using the data collection instrument in Appendix A. Five records used in a pilot study were also included in the final data analysis.

#### Measurement

There is no established checklist or research tool available to assess lifestyle modification instruction or hypertension management (follow-up) adherence by military healthcare providers according to the hypertension guidelines (JNC VI, 1997). A checklist was developed by the researcher to audit the medical records in order to ascertain whether healthcare providers adhere to these hypertension guidelines in the management of hypertension (follow-up) or recommended lifestyle modifications for hypertension. The checklist was developed using the management of hypertension (follow-up) and lifestyle modification recommendations (See Table 2). The recommendations were reviewed and documented on this checklist with each medical record reviewed. The review started with the initial appointment for hypertension and proceeded through the first hypertension management (follow-up) appointment.



Demographic data of age, gender and race of the subject was included on the checklist. In addition to the type of clinic where the patient was diagnosed, evaluation and treatment for hypertension was included in the demographic section of the study. The type of credentialed provider (advanced practice nurse, physician assistant or medical doctor) who rendered care for hypertensive patients was also noted on the demographic section of the checklist.

Hypertension management (follow-up) was determined by ascertaining the date of initial hypertension diagnosis, the follow-up date recommended by the provider, and the actual date the patient was seen for his/her follow-up appointment for hypertension. This data was compared with the hypertension guideline (JNC VI, 1997) recommendations for follow-up based on initial blood pressure measurements for adults (See Table 2).

The prescription of lifestyle modifications was derived by determining whether lifestyle modifications were recommended by the provider on the initial appointment for the diagnosis of hypertension, or on the subsequent hypertension management (follow-up) appointment. This data was also compared to the JNC VI (1997) guidelines for hypertension prevention and management (see Appendix A).

#### Pilot Study

The checklist was assessed for content-validity following review by four healthcare experts. The experts included a physician assistant, a family nurse practitioner, a family practice physician, and an internist. Content validity ascertains the extent to which the method of measurement includes all the major elements relevant to the construct being measured (Burns & Grove, 1997, p. 792). The Index of Content Validity was used to determine relevance of constructs measured (Waltz & Bausell, 1981). In this study, a content validity index of .80 was obtained.

After completing the content validity requirement of the checklist, this researcher

determined the degree of reliability by conducting a pilot study. The pilot study included a review of five eligible records with use of the data collection instrument devised by the researcher. Reliability represents the consistency of measure obtained (Burns & Grove, 1997, p. 792). Inter-rater reliability measures were used in the pilot study to decrease bias. This researcher and another professional registered nurse audited the same medical records on two different occasions with a two-week time period between each review. The numbers of identical item responses will determine the degree of reliability. A total of five checklist items were evaluated. A reliability.90 (Pearson Product Moment Correlation) was obtained.

#### Protection of Human Subjects

Prior to the initiation of this study, a copy of this proposal was provided and written approval was obtained from the Institutional Review Board (IRB), at the Uniformed Services University of the Healthcare Sciences. After this approval, written permission was sought to conduct this study at a midsized United States Air Force Medical Treatment Facility through their IRB. Copies of IRB approval were provided to the Officer in Charge (OIC) of outpatient records sections and the personnel in charge of the clinical record section prior to obtaining medical records. The data collection checklist did not contain any identifying information such as name, social security number, or rank/grade.

Patient confidentiality was paramount in this study. Access to names, diagnosis, social security numbers, and other personal information reviewed by healthcare providers was limited to this researcher through a coding system. Medical records that were obtained from the outpatient records section in the Internal Medicine Clinic and Family Practice Clinic were returned immediately following the chart audit. This researcher

ensured that medical records were not removed from the clinic area. No attempt was made to associate research results with either healthcare providers or their patients.

#### Data Analysis

The Statistical Package for the Social Sciences (SPSS, 1998) software program was used to analyze data. The data was analyzed according to the two sections of the data collection tool. The sections of the data collection instrument include: (a) demographic data and (b) hypertension guideline (JNC VI, 1997) recommendations.

#### Demographic Data

Demographic data included: (a) subjects age, gender, and race; (b) clinical setting such as type of primary care clinic, and (c) provider type such as advanced practice nurses, physician assistant, family practice physician or medical resident. Demographic data were summarized by descriptive statistics using totals, percentiles, and measures of central tendency such as mean and mode.

#### JNC VI (1997) Hypertension Guidelines

The hypertension guidelines (JNC VI, 1997) include: (a) time from initial diagnosis of hypertension to first follow-up visit; (b) actual initial and follow-up blood pressure readings; and (c) recommended lifestyle modifications. Data was reported according to range of blood pressure measurement and time to follow-up examination. All data was compiled using descriptive statistics. The blood pressure readings and follow-up time span were also summarized according to mean, and range. Lifestyle recommendations were documented using totals and percentiles.

The data on hypertension management (follow-up) recommendations by military healthcare providers were noted. This data was compared to JNC VI (1997) guidelines.

A difference in healthcare provider recommendations and guidelines were reported using descriptive statistics. These recommendations vary depending on initial blood pressure readings (See Table 2).

Frequency and percentiles of lifestyle modification prescriptions provided were tabulated. The frequency and percent of each provider who ordered lifestyle modifications were determined and compared to hypertension guidelines (JNC VI, 1997). The following Timeline represents the specified time frame for the completion of the research process (See Table 3).

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**Table 3**  
**Timeline for Completion of Thesis**

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1. Obtain IRB Approval	October 1999
2. Obtain listing of potential medical records	October 1999
3. Contact personnel to obtain access to records	October 1999
4. Conduct Pilot Study/Data collection	November 1999
5. Transcribe/Analyze data	December 1999
6. Prepare draft report	December 1999
7. Obtain Committee review of draft	January 2000
8. Prepare final draft	January 2000
9. Hold Thesis defense	February 2000
10. Make revisions as needed	March 2000
11. Obtain Committee signatures	March 2000
12. Submit Thesis for binding	April 2000

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### Summary

This study consisted of a retrospective chart review using a descriptive design to ascertain healthcare provider adherence to hypertension guidelines (JNC VI, 1997) for hypertension management (follow-up) and lifestyle modification recommendations. A newly developed checklist was utilized for data collection. A panel of four experts established content validity. A pilot study was conducted to determine the reliability of

the checklist. Continual attention to patient confidentiality was assured.

## CHAPTER IV: DATA ANALYSIS

### Introduction

The purpose of this study was to describe whether military healthcare providers adhere to *The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*, (JNC VI, 1997), Hypertension patient guidelines in a United States Air Force Medical Treatment facility. This chapter presents a description of the sample, demographics, and provider practice methods in the management of their hypertensive patients. This study specifically described the hypertension management recommendations for follow-up care and lifestyle modifications made by healthcare providers.

### Sample

The sample for this study was drawn from a potential population of 350 records of hypertension patients. Medical Records Administration personnel provided the researcher with a list of patients diagnosed and treated for hypertension over the last 24 months according to ICD-9 codes. Of the population of hypertension patients, a convenience sample of 35 records were obtained. The researcher chose the first 35 records that met the established eligibility criteria described in the methodology section of thesis due to convenience and time constraints. Of the 35 records, 37% of eligible records were from the Family Practice Clinic, 37% from the Primary Care Clinic, 23% from the Internal Medicine Clinic, and 3% from the Cardiology Clinic (See Table 4).

**Table 4****Demographic Characteristics of Clinics**

Clinic	Frequency	Percent
Family Practice	13	37
Primary Care	13	37
Internal Medicine	8	23
Other (Cardiology)	1	3
Total	35	100

The ages of the subjects according to the records were from 41-82 years of age. Median age for this sample was found to be 62, and mean age was 63 with a standard deviation of 10.27. Most of the subjects were female (63%). In addition 57% of the subjects were Caucasian, 37% African-American, 3% Hispanic, and 3% Asian. Table 5 describes the demographic characteristics of the sample according to age, gender and race.



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**Table 5.**  
**Demographic Characteristics of Sample**

Characteristic	Frequency	Percent
Age		
41-82	35	100
(Mean Age 63)		
Gender		
Male	13	37
Female	22	63
Race		
Caucasian	20	57
African-American	13	37
Hispanic	1	3
Asian	1	3
Total	35	100

There were numerous secondary diagnoses in addition to essential hypertension. The most common noted were diabetes and hyperlipidemia, each accounting for 25% of the sample. Coronary artery disease was also identified approximately in 12% of the records and hypothyroid conditions presented in about 6% of the records. Table 6 provides a summary of the secondary diagnosis of the subjects according to record review. It is interesting to note that over 50% of the records reviewed reported a secondary diagnosis of diabetes, hyperlipidemia/hypercholesteremia or coronary artery disease.

**Table 6.****Demographic Characteristics of Secondary Diagnoses**

Diagnosis	Frequency	Percent
Diabetes	7	20
Hyperlipidemia	7	20
Coronary artery disease	4	11
Hypothyroid	3	9
Peptic ulcer disease	2	6
Fibrocystic breast disease	2	6
Breast cancer	1	3
Depression	1	3
Alcoholic hepatitis	1	3
Grave s disease	1	3
Hypercholesteremia	1	3
Migraines	1	3
Polyps	1	3
Prostate cancer	1	3
None	2	6
<b>Total</b>	<b>35</b>	<b>100*</b>

\*Subjects could have more than one secondary diagnosis

Physicians (80%) treated most of the patients diagnosed. Table 7 provides a summary of healthcare providers according to specialty.

---

**Table 7.**

**Demographic Characteristics of Providers**

Provider	Frequency	Percent
Family Practice Physician	19	54
Internal Medicine Physician	9	26
Advanced Nurse Practitioner	4	11
Physician Assistant	3	9
Total	35	100

Blood pressure readings of the subjects ranged from a systolic measurement of 133 to 201, with a mean of 160 mm Hg and a standard error of 2.47. A diastolic measurement of 63 to 108 mm Hg with a mean of 85 mm Hg and a standard error of 1.7. With these readings the researcher examined all stages of blood pressure according to JNC VI (1997) follow-up guidelines. Table 8 summarizes blood pressure descriptives.

**Table 8.****Descriptives of Blood Pressure**

Description	Result
Systolic Blood Pressure	
Mean	160.43 mm Hg
Minimum	133 mm Hg
Maximum	201 mm Hg
Range	68 mm Hg
Diastolic Blood Pressure	
Mean	85.26 mm Hg
Minimum	63 mm Hg
Maximum	108 mm Hg
Range	45 mm Hg

In examining the weight of the patients in the sample, it was discovered that no height was documented on 12 records, (34%). The weight of the patients fared much better with documentation, one record, (3%) of the records did not have a weight recorded. In addition, one record, (3%) did not include height or a weight documentation. To obtain a body mass index (BMI) which will ascertain whether a patient is overweight and in need of weight reduction education, both the height and the weight are necessary. It was found that a healthcare provider could not determine whether weight reduction

counseling was appropriate in 37% of the sample because BMI could not be determined as a result of inadequate documentation (see Table 9).

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Table 9

Descriptives of Height, Weight, and Body Mass Index (BMI)

	Documented	Not Documented
Height Measurement	23	12
Weight Measurement	34	1
*BMI Obtainable	22	13

\*BMI determinations were calculated by researcher, however no recorded BMI measurements were noted on any medical record.

When determining smoking history of a patient in the sample, it was found that six records (17%) had a positive smoking history documented. One record (3%) did not have documentation of smoking history. Table 10 provides a summary of descriptives of smoking history. Thirty-four records (98%) were found to have documentation of smoking history.

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**Table 10.****Descriptives of Smoking History**

	Frequency	Percent
Positive smoking history	6	17
No smoking history	28	80
<u>Not documented</u>	<u>1</u>	<u>3</u>
<u>Total</u>	<u>35</u>	<u>100</u>

Concerning alcohol use, thirteen records (37%) revealed documentation of alcohol consumption. Of those records where alcohol use was reported, 21 records (60%) of the sample did not consume any alcohol, and 1 record (3%) of the sample had no documentation available on alcohol use. Most providers (97%), had available to them some information on their patients alcohol use. A documented history of alcohol use revealed that 21 subjects (60%) used alcohol. However, the records did not include information of the amount of alcohol consumed. Table 11 provides a summary of descriptive statistics on alcohol use.

**Table 11.****Descriptives of Alcohol Use**

	Frequency	Percent
Positive alcohol history	13	37
No alcohol history	21	60
Not documented	1	3
<b>Total</b>	<b>35</b>	<b>100</b>

Finally, when breaking down the sample concerning identified management guidelines, fifteen records, (43%) of the patients had a blood pressure in the range 140-159 mm Hg systolic or 90-99 mm Hg diastolic. Sixteen patients (46%) of the sample had a blood pressure ranging 160-179 mm Hg systolic or 100-109 mm Hg diastolic, while the remaining 4 (11%) records had a systolic blood pressure 180 mm Hg or a diastolic blood pressure of 110 mm Hg or greater. Table 12 provides a synopsis of blood pressure data.

#### Guideline Adherence

The following summarizes how the sample fared concerning the extent military healthcare providers adhere to recommendations for hypertension management provided by the Military healthcare providers gave very little specific dietary instructions concerning *The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure*, (JNC VI, 1997) recommendations for (a) lifestyle



modification, and (b) blood pressure monitoring (follow-up).

Blood pressure monitoring

First, to be examined is the extent of military healthcare provider s adherence to JNC VI (1997) standards concerning blood pressure monitoring (follow-up) recommendations. Data revealed that these healthcare professionals complied very well with prescribed standards. In the sample of 35 records, data revealed thirty-three records (94%) of the patients received appropriate follow-up instructions. Only two records (6%) of the sample were not given appropriate follow-up instructions. Both patients who did not receive appropriate follow-up instructions were in the blood pressure category of systolic blood pressure 140-159 mm Hg or diastolic blood pressure of 90-99 mm Hg (Stage I). This category of blood pressure management required confirmation and follow-up of blood pressure within two months. Table 12 provides a summary of adherence to follow-up recommendations based on each stage of blood pressure severity.

---

**Table 12.****Descriptives of Results Based on Follow-up Recommendations for Hypertension**

Stage	Systolic	Diastolic	Frequency	Percent Follow-up Adherence	
	130-140mm Hg	85-89mm Hg	0	0	0
1	140-159mm Hg	90-99mm Hg	15	43	13
2	160-179mm Hg	100-109mm Hg	16	46	16
3	≥ 180mm Hg	≥ 110mm Hg	4	11	4
<b>Total</b>			<b>35</b>	<b>100</b>	<b>94 %</b>

Next, this researcher examined the extent of military healthcare providers adherence to the JNC VI (1997) standards concerning lifestyle modifications. Adherence to each identified lifestyle modification recommendation will be described individually according to each research question.

#### Weight Reduction

Research question one was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding weight loss, if overweight (overweight is a body mass index [i.e. weight in kilograms divided by height in meters square]) of 27 or greater?

As described earlier, due to inadequate documentation, it was virtually impossible to determine BMI on 37% of the sample. Twelve patients (35%) did not have height documented and one patient (3%) did not have a weight recorded in the medical record. To determine BMI, both height and weight are needed. In patients with a known BMI, it

was found that 17% of the sample had a BMI less than 27% and did not require weight loss counseling. Sixteen patients (46%) of the sample had a BMI greater than 27% and would benefit from weight reduction counseling. It should be noted that the researcher calculated BMI measurements and no references of BMI were observed in any medical record. See Table 13 for summary of overweight patients.

---

**Table 13.**

**Documentation of BMI**

BMI calculated	Frequency	Percent
BMI not obtainable	13	37
BMI < 27 %	6	17
BMI > 27%	16	46
Total	35	100

The provider breakdown for weight loss counseling is as follows: When weight loss instructions were found to be appropriate, 36 % of all military healthcare providers suggested weight reduction. Fifty percent of Advanced Nurse Practitioners suggested weight reduction to eligible patients and no Physician Assistants offered such advice. Thirty-one percent of the Family Practice Physicians and fourteen percent of the Internal Medicine physicians offered weight loss instructions. Table 14 provides a summary of individual provider weight loss instructions.

---

**Table 14.****Weight loss instructions for BMI > 27 by provider**

Provider	Frequency	Percent
Advanced Nurse Practitioner		
Yes	2	50
No	2	50
Family Practice Physician		
Yes	5	31
No	11	69
Internal Medicine Physician		
Yes	1	14
No	6	86
Physician Assistant		
Yes	0	0
No	3	100

Alcohol Use

Research question two was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding limiting alcohol intake to no more than 1 ounce (30 mls) of ethanol? (This equals 24 ounces of beer or 2 ounces [60 mls] of 100 proof whiskey per day or 0.5 ounces [15 mls] of ethanol per day for women and lighter weight people).

When the lifestyle modifications of limiting alcohol intake to no more than one ounce (30 mls) of ethanol per day was examined, it was discovered that only 7 patients (20%) of the sample were in need of counseling. Four of these patients (57%) did not have any instructions on alcohol consumption documented in their medical records. The remaining three patients

(43%) were provided alcohol instructions. Table 15 provides a brief summary on alcohol intake instructions.

---

**Table 15.**

**Alcohol Intake Instructions**

Limit Alcohol intake	Frequency	Percent
Yes	3	9
No	4	11
Not Applicable	28	80
Total	35	100

Exercise

Research question three was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding increasing aerobic physical activity (30-45 minutes, 4 days of the week)?

When addressing the need to increase aerobic activity to 30-45 minutes at least four days per week to aid in blood pressure management, it was revealed that 14 (40%) of the patients exercised regularly. This left 21 patients in the sample in need of exercise education. Of the 21 participants, 38% of those in need to increase activity to improve blood pressure were provided with instructions. Table 16 provides a summary of aerobic activity instructions available in the sample medical records.

**Table 16.****Aerobic Activity Instructions**

Increase exercise	Frequency	Percent
Yes	8	23
No	25	71
Not Applicable	2	6
Total	35	100

Nutrition

Research question four was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding reducing sodium intake to no more than 100 mmol/day (2.4 grams of sodium or 6 grams of sodium chloride)?

Research question five was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding maintaining adequate intake of dietary potassium (approximately 90 mmol/day)?

Research question six was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding maintaining adequate intake of dietary calcium and magnesium for general health?

Specific nutrition instructions were assessed. Records were reviewed to determine if military healthcare providers instructed their patients on reduction of sodium

to no more than 100 mmol/day (2.4 grams of sodium or 6 gms of sodium chloride), maintenance of adequate potassium (approximately 90 mmol/day) and maintenance of adequate intake of calcium and magnesium for general health. Military healthcare providers gave very little specific dietary instructions concerning these electrolytes and minerals. Two records (6%) revealed instructions were given for patients to limit sodium intake. Three records (9%) of the sample provided any information on maintaining adequate potassium intake. One record (3%) of the sample was provided information concerning adequate calcium intake. Nutritional instructions regarding the use of magnesium was not recorded on any medical record. Although specifics on nutrition pertaining to sodium, potassium, calcium and magnesium was not given by individual providers, 9 out of 35 (25%) reported a consultation to the nutritionist. Table 17 summarizes nutritional counseling provided by military healthcare providers in the medical records.

**Table 17.****Nutrition Instructions**

Electrolytes/Minerals		Frequency	Percent
Sodium	Yes	2	6
	No	33	94
Potassium	Yes	3	9
	No	32	91
Calcium	Yes	1	3
	No	34	97
Magnesium	Yes	0	0
	No	35	100

Smoking Cessation

Research question seven was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding smoking cessation and reducing intake of dietary saturated fat and cholesterol for overall cardiovascular health?

Next, the healthcare recommendation of smoking cessation was examined. Military healthcare providers were very good at recognizing the hazards of cigarette smoking and teaching their patients of the perils of smoking. Seventeen percent of the records identified patients who smoked, and all were instructed to stop.



### Dietary Modification on Fat and Cholesterol

Research question eight was to identify to what extent do Military Healthcare Providers adhere to the JNC VI recommendations regarding smoking cessation and reducing intake of dietary saturated fat and cholesterol for overall cardiovascular health?

This researcher examined the military healthcare providers adherence to instructing their patients of the reduction of dietary saturated fats and cholesterol for overall cardiovascular health. Twenty records (57%) reported at least some form of dietary instruction. Specifics on cholesterol counseling however showed that only 6 records (17%) had documentation in this area. This is not to say dietary instructions were not given. It was found when inquiring of any dietary instructions given to this sample of hypertensive patients, that 20 patients (57%), were provided with at least some dietary instruction in relation to their hypertension management. Of particular importance, it was discovered that a vast majority of Advanced Nurse Practitioners provided dietary instructions 3 out of 4 times (75%) of the time. Physician Assistants provided dietary instructions 2 out of 3 times, or 66% of the time. Family Practice Physicians and Internal Medicine Physicians who provided dietary counseling 53% and 56% of the time respectively. Table 18 provides a summary of healthcare provider dietary instructions.

**Table 18.****Dietary Instructions by Provider**

Provider	Frequency	Percent
Advanced Nurse Practitioner		
Yes	3	75
No	1	25
Family Practice Physician		
Yes	10	53
No	9	47
Internal Medicine Physician		
Yes	5	56
No	4	44
Physician Assistant		
Yes	2	67
No	1	33

Dietary Consultation

Military healthcare providers were assessed according to their documentation of dietary consultation on further nutritional education for their patients. Also available to these military healthcare providers were the services of the Health and Wellness Center (HAWC). This organization also provides nutritional information and lifestyle modification techniques to concerned individuals. Results revealed that six records (17%) identified patients in the sample were recommended for dietary consultation or referral to the HAWC. Of all providers referring patients to the HAWC, it revealed documentation of dietary counseling and referral by 25% of the Advanced Nurse Practitioners, 66% of the Physician Assistants, 16% of the Family Practice Physicians, and none of the Internal Medicine Physicians provided these referrals. Table 19

summarizes provider referrals to the Health and Wellness Center.

**Table 19.**

**Referrals Made to the Health and Wellness Center by Provider**

Provider	Frequency	Percent
Advanced Nurse Practitioner		
Yes	1	25
No	3	75
Family Practice Physician		
Yes	3	16
No	16	84
Internal Medicine Physician		
Yes	0	0
No	9	100
Physician Assistant		
Yes	2	67
No	1	33

**Summary**

A total of 35 records were reviewed for this study. The Family Practice Clinic provided care for 37% of the sample, while Primary Care, Internal Medicine and Cardiology serviced 37%, 23%, and 3% respectively. Of the provider sample, 11% were Advanced Nurse Practitioners, Physician Assistants comprised 7% of the sample, while Family Practice Physicians and Internal Medicine Physicians comprised 54% and 26% respectively.

When this researcher examined data concerning the extent to which military healthcare providers adhere to JNC VI (1997) guidelines concerning blood pressure monitoring (follow-up) recommendations, it was found that 94% of the sample complied

with these recommendations. However, when determining the adherence of the JNC VI (1997) standards concerning lifestyle modifications, recommendations by these same providers, the results were less satisfactory. The researcher found that an initial determination of overweight is a BMI greater than 27% could not be determined on 37% of the sample. In the sample that an overweight determination was made, 36% of the providers suggested weight reduction. In addition alcohol consumption was not documented in 20% of the records, and those who were in need of counseling 43% were not provided with any alcohol reduction instructions.

Further, when assessing the adherence to JNC VI (1997) recommendations for aerobic activity, it was found that 38 % of those patients in need of education concerning aerobic activity were provided with education. The same providers were excellent in identifying the need, and making recommendations for smoking cessation. One hundred percent of those with a positive smoking history documented (six records) were instructed on smoking cessation. Specific dietary recommendations given by military healthcare providers in this sample was less successful than smoking education. Instruction on sodium intake was given to 6% of the sample. This low percentage of military healthcare providers explaining the importance of dietary regimens on their hypertension continued with limited calcium, potassium and magnesium information being supplied to these patients, 9%, 3% and 0% of the time respectively. Information on the reduction of dietary fats was given to 17% of the sample. Finally, any dietary instructions at all by military healthcare providers were just over half of the sample, at 57%.

## CHAPTER V: SUMMARY

### Conclusions and Recommendations

In order to provide guidance to healthcare providers concerning their practice of treating hypertension, *The Sixth Joint National Committee on Detection, Evaluation and Treatment of High Blood Pressure* (JNC VI, 1997) has provided direction based on current scientific literature. The purpose of this study was to describe whether Military Healthcare Providers adhere JNC VI (1997) hypertension patient guidelines with special attention on lifestyle modifications and provision of follow-up instructions upon initial diagnosis of hypertension as documented in the patient's medical record in a midsize Air Force Treatment Facility. Using a descriptive quantitative design, eight research questions were investigated during a retrospective chart review of 35 medical records.

A convenience sample of 35 medical records was obtained for this study. This sample was drawn from a potential population of 350 patients with the diagnosis of essential hypertension and treated for high blood pressure in the last 24 months. The first 35 records that met eligibility criteria as outlined in the methodology section of this study were selected for review.

### Guideline Adherence

The first research question asked addressed provider adherence to JNC VI (1997) guidelines on hypertension follow-up recommendations. Diligent monitoring of the hypertensive patient is paramount. The uncontrolled, unexamined hypertensive patient is at an increased risk for coronary artery disease, congestive heart failure, stroke, ruptured aortic aneurysm and retinopathy (Preventive Services Task Force, PSTF, 1996). It was found that Military Healthcare Providers had great success following JNC VI (1997) guidelines on follow-up recommendations. This study revealed that 94 percent of the records met this standard.

Military Healthcare Providers were equally effective in teaching patients the perils of cigarette smoking. The literature available to providers to educate his/her patients of the effects of cigarette smoking and how to stop this dangerous past time is immense. This study found that all of the patients who were identified as smokers were given instructions to quit smoking.

The literature for JNC VI (1997) recommendations covering alcohol consumption is not quite as convincing as that of smoking cessation. Itoh et al. (1997) with Jerez and Coviello (1998), show a relationship with alcohol consumption and hypertension. Cushman et al. (1998), reported that their data did not find the same results, thereby refuting this premise. This study revealed that Military Healthcare Providers instructed 45 percent of patients that were identified in need of education addressing alcohol intake according to JNC VI (1997) guidelines.

The beneficial effects of regular exercise on hypertension are well documented. Neiman (1998) and Hsieh et al. (1998) provide data that regular exercise is a powerful weapon in combating hypertension. This study revealed that 60 percent of the sample did not have documentation of exercise activity on individual patients. Thirty-six percent of the patients who could benefit from exercise education were provided with information.

Through recommending increase in exercise with weight loss education, a provider could double the benefit to hypertensive patients. Neiman (1998) found that the risk of developing high blood pressure was tripled if one was overweight. Whelton et al. (1998), Wheaton et al. (1997), Jones (1996), and McCarren and Reusser (1996) showed the relationship of obesity and hypertension. An individual with a BMI greater than 27 percent would benefit from weight reduction counseling. It was discovered in this study that providers could not determine a BMI in 37 percent of the patients due to inadequate documentation in the patient's record. Weight reduction education was provided to 36

percent of eligible patients in need of this instruction.

Weight loss and control of saturated fat often work hand in hand. Kuller (1997) with Beegon and Singh (1997) revealed a strong association between hypertension and saturated fat intake. Military Healthcare Providers supplied 17% of the patients with education on reduction of dietary fat intake.

Sodium consumption has long been associated with hypertension. Many studies such as Weinberger (1997), Beard et al. (1997), with Messerli et al. (1997) all support the consensus of the relationship between sodium intake and hypertension. It was revealed in this study that 5.7% of the sample were educated on dietary sodium intake. Patient education on nutritional intake of other electrolytes and minerals in this study showed similarly poor outcomes.

It has been discussed how the intake of various electrolytes and minerals can have a positive effect on the management of hypertension. Berri and Wingo (1997) reveal that potassium has an anti-hypertensive effect. McCarron (1997) discovered that adults who meet or exceed the recommended daily allowance of calcium, potassium and magnesium have protection against salt sensitivity. Summanen et al. (1994) found that supplementation with a combination of potassium and magnesium lowered systolic blood pressure. The sample participants in this study could have benefitted greatly with this information. However, 8.6% of patients in this research study were provided education on potassium intake. Calcium and magnesium education was even less forthcoming, with Military Healthcare Providers supplying information to these patients only 2.9% to 0%, respectively.

#### Recommendations for Practice

As stated earlier, a limitation of this study is its limited generalizability. This is due to the fact that the data was derived from a single Medical Treatment Facility. However,

the data obtained in this small study is similar to the findings discovered in larger studies. Greenwood et al. (1995) buttressed this researchers finding by publishing that lifestyle modification direction was given only to 5% in their sample of 3, 304 hospitalized patients. A 1998 study by Stafford et al. echoed results similar to this study by finding that 13% of physicians studied believed facilitating lifestyle modifications were important. As discouraging as the 1995 Greenwood et al. and the 1998 Stafford et al. studies are, this study provides a glimmer of hope for how Advanced Nurse Practitioners address lifestyle modifications.

The provider behavior data obtained from Greenwood et al. (1995) and Stafford et al. (1998) studies were solely concerned with physician adherence. This study assessed not only physician performance, but also Advanced Nurse Practitioners and Physician Assistants. This small investigation revealed a better compliance to JNC VI (1997) lifestyle modification recommendations by Advanced Nurse Practitioners than physicians did in all areas of instructions. Advanced Nurse Practitioners lead the way for physicians in dietary instructions, weight loss instructions, and Health and Wellness Center referrals.

This study has shown that current practice can be improved in a number of ways. First, healthcare providers must ensure that appropriate and adequate documentation of patient data is available in the medical record. Height and weight indices are necessary in order to ascertain a patient s BMI and whether weight reduction counseling is indicated. Also, it is important to determine patients social activities, such as cigarette smoking and alcohol consumption. Finally, it would be helpful for the healthcare providers to have available documentation of the amount of physical activity patients are getting. If all of this information was readily available in the medical record for providers to examine, it could be quickly assessed whether lifestyle modification was in order at a glance.

Secondly, Military Healthcare Providers could better utilize resources available for



dietary counseling. Nutritional healthcare professionals could be utilized more often as a valuable resource. Dietitians could assess the dietary needs of hypertensive patients and be better able to provide the time required informing how dietary changes could improve high blood pressure. In the process of this study it was discovered that a small number of patients, 17 percent, were referred to the Health and Wellness Center for some lifestyle modification instructions. This resource could also be used to a greater capacity to better serve sample members.

#### Future Research

Additional studies could be done focusing on the topic of providers instructions to their hypertensive patients concerning healthy lifestyles, and in some cases, lifestyle modifications. Providers could be surveyed about their knowledge of hypertension modification instructions, as well as any barriers to them prescribing these lifestyle modifications to their clients. Studies could also examine how allied healthcare professionals, such as dietitians and/or health and wellness specialists could aide in teaching patients with high blood pressure lifestyle modification techniques that would benefit them.

#### Summary

This study examined to what extent Military Healthcare Providers adhere to JNC VI (1997) standards concerning follow-up instructions and lifestyle modifications. It was discovered that Military Healthcare Providers fared very well in maintaining oversight of their hypertensive patients by providing excellent follow-up management. However, when exploring how these same Military Healthcare Providers addressed JNC VI (1997) standards on lifestyle modification prescriptions to their patients, the results were not as favorable. There was a low compliance with weight loss instruction, the limitation of alcohol use, and the need to increase physical activity. There was also low compliance in

the dietary education of reducing sodium intake, maintaining adequate potassium, calcium, and magnesium. Patients in this study were also not provided with adequate information about decreasing dietary fat. However, Military Healthcare Providers were exceptional in both identifying and counseling cigarette smokers to cease this dangerous practice.

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