A PROTOCOL FOR ADVANCED PRACTICE NURSES IN PRIMARY CARE TO ASSESS AND REDUCE RISK FACTORS FOR STROKE IN THE ADULT

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ABSTRACT

Stroke is the third leading cause of death in America and it is the number one preventable cause of adult disability (American Heart Association, 1997). Stroke risk factors are frequently encountered in the family practice population. Most stroke survivors have not been effectively diagnosed or treated for underlying risk factors prior to the onset of stroke. Several barriers have been identified that reduce the likelihood of correct diagnosis and effective treatment of stroke risk factors. The Health Belief Model (Rosenstock, 1974) provides a theoretical framework for demonstrating how these barriers can be reduced in order to provide effective treatment to prevent stroke.
The purpose of this project was to develop a protocol using the guidelines from the National Stroke Association (NSA). This is designed by Advanced Practice Nurses in Family Practice. This can be used to assist the APN to identify, educate, and counsel patients at risk for stroke. A suggested protocol for evaluation of the utility and validity of the tool is provided.

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Introduction

Stroke is a serious and common illness in the United States. A stroke occurs when brain cells die because they are not getting enough blood, or when a blood vessel bleeds into the brain (Hwang & Glass, 1999). About 80% of strokes are caused by the blockage of an artery in the neck or brain (ischemic stroke) and the rest are caused by bleeding into or around the brain (hemorrhagic stroke).

Data on the incidence of stroke collected by the American Heart Association (1997) indicate that in the United States there is a stroke about every minute and a person dies of stroke about every three minutes. Currently there are 4,000,000 Americans who have suffered a stroke and have survived. The death rate is approximately 30% of all stroke victims (American Heart Association, 1997).

Stroke is a preventable disease. Epidemiological studies have identified several risk factors. Risk factors are well documented and include modifiable and non-modifiable factors. Risk for stroke doubles every ten years for those over age 55 (Hwang & Glass, 1999). African-Americans have both a doubled incidence of stroke and a doubled risk of dying from stroke compared to the Caucasian population (Gorelick, 1997).

Disability is a significant factor in 55% of all stroke survivors (Gorelick, 1997). The disability cost from stroke includes the direct costs of health care and the indirect costs of lost productivity for both stroke survivors and family care givers. This was last estimated in 1996 to be 40 billion dollars annually (Taylor, Davis, Torner, Holmes, Meyer, & Jacobson, 1996). Prevention strategies and improved treatments could

significantly reduce the disability and financial burden of stroke care. More important, however, would be the positive impact on patients, families, and communities. Cost-effectiveness, while maintaining quality is the essence of managed care.

Significance of the Problem

Prevalence

Stroke is the third leading cause of death in the United States, being responsible for 150,000 deaths annually (Broderick, Brott, & Kothari, 1998). Approximately 731,000 new strokes occur every year, and there are an estimated 4,000,000 stroke survivors (Broderick, et al., 1998). There has been an overall decline in stroke mortality rate since the 1980's.

Data suggest that both decreased incidence and improved survival due to cardiovascular health initiatives since World War II have contributed to the decline (NSA, 1996), yet the decline in stroke mortality rate has plateaued since the early 1990's (Broderick, et al., 1998).

Age is an important risk factor for stroke. As population in the United States ages, the incidence of stroke increases. The most recent death rates due to stroke were higher in men (69 per 100,000) than in females, (46.9 per 100,000) (NSA, 1996). However, in the population age 65 years and over, the stroke mortality rate was higher in women than in men. The reason for this apparent contradiction is that women outlive men and that age is an important risk factor for stroke (Sacco, Wolf, & Gorelick, 1999).

Stroke Related Disability and Financial Impact

Stroke is both the leading cause of adult disability and the leading diagnosis for long-term care. Approximately $40 billion is spent annually for stroke survivors with varying degrees of neurological and functional disabilities (Taylor, et al., 1996). Sixteen percent of all stroke survivors are institutionalized, while 71% remain vocationally impaired after seven years; 34% under age 65 years are unemployed (NSA, 1996).

In addition to not being able to continue with prior levels of activity and mobility, these patients require help from outside the home. About half of them require day-hospital services, 40% require home help, 40% utilize a visiting nurse, and 14% utilize adjunct services such as Meals on Wheels (Anderson, Linto, & Stewart-Wynne, 1995). According to Fraser (1999), caregiver burden is another factor that impacts the financial burden of stroke. A significant number of stroke survivors require help. Caregivers are most often female, either a spouse or a daughter. Seventy-four percent indicate that they have insufficient resources necessary to provide care. Sixty-two percent report depression or anxiety (Fraser, 1999).

Historical Perspective

The earliest description of stroke appeared when Hippocrates used a broad term called apoplexy to denote a syndrome of loss of speech, paralysis of parts of the tongue, and weakness or paralysis of parts of the body (Leonard, 1996). Knowledge about the anatomy and physiology of stroke was limited, so the term "apoplexy" was a term which encompassed a broad number of etiologies that could have produced signs and symptoms of stroke. Apoplexy, which means "struck with violence" in Greek is a most fitting description for the sudden changes in the physical well being which occurs in stroke

victims (Leonard, 1996). From the early accounts of stroke, physicians sought to identify parts of the brain to identify its functions and the course of blood through cerebral blood vessels (Leonard, 1996).

In the 17th century, Wepfer discovered that bleeding within the brain was a primary cause of "apoplexy". He also described obese people with red faces and erratic heartbeats as highly susceptible to stroke. He also describes the clinical syndrome of transient ischemic attacks in people who have a brief episode of apoplexy and then return to normal. Morgagni in 1761 was able to further describe the neuropathologic findings after hemorrhage, correlating the lesion site with symptoms. He further described a nonhemorrhagic apoplexy from autopsy observations he made, noting changes within the brain parenchyma in people who had experienced apoplexy. Throughout this period it was recognized that stroke was caused by changes in blood flow (Leonard, 1996).

Early in the 20th century, Abercrombie delineated the stroke classifications similar to what we use now. He divided apoplexy into cerebral hemorrhage with massive infarction, subarachnoid hemorrhage and cerebral vascular insufficiency. Subsequently, clinical investigations led to the concepts of "vessel disease" as the cause of stroke. These cerebral circulation changes were called "cerebral accidents" leading to the term "cerebral vascular accident" to denote stroke (Leonard, 1996). In the late 1900's vascular disease was found to be only one cause of stroke (Wolf, & D'Agonistino, 1998).

More recent observations have identified changes in the blood itself such as hypercoagulable states, alteration in cardiac status such as atrial fibrillation, and certain genetic disorders as also being responsible for causing disruption in brain functioning. As more mechanisms of stroke have been identified, the term "accident" is no longer

appropriate. These observations have put more emphasis on identifying risk factors for stroke and acute therapy as opposed to rehabilitative services. The window of opportunity to impact functional outcomes in acute stroke must occur prior to the event through education and treatment aimed at reducing risk factors (Daley, Braimah, & Sailor, Kongable, & Barch, 1997).

Risk Factors

Stroke is a primary cause of long term disability in the industrialized world (Gorelick, Sacco, Smith, & Alberts, 1999). Identification and treatment of patients at high risk for stroke have become standard medical practice and a major goal of stroke prevention. Risk factors for stroke can be divided into three categories: uncontrollable, controllable, and contributing factors (Gorelick, et al., 1999).

Uncontrollable factors include age, gender, race, heredity, and prior stroke. Age is the most powerful uncontrollable risk factor. After age 55 the risk of stroke increases rapidly with advancing age. Men have a higher incidence of stroke, although post-menopausal women tend to have the increased risk as the protective effect of estrogen is lost (Kothari, Hall, & Broderick, 1996).

Race contributes to the risk of stroke. African Americans have twice the risk of Caucasians. Asian Pacific Islanders and Hispanics also have a higher risk of stroke than Caucasians. Family history also increases risk for stroke although the correlation is not as strong as with cardiovascular disease (Gorelick, et al., 1999).

Controllable risk factors include hypertension, heart disease, high red blood cell count, elevated blood cholesterol, and diabetes mellitus. Recognition of these risk factors by patients and health care professionals is important in terms of reducing the incidence

of stroke. Hypertension is the most important controllable risk factor for strokes, playing a factor in 70% of all strokes, therefore affecting 43 million in the United States (Brown, 1996). According to Gorelick (1997) there is a ten-fold increased risk for those with diastolic mean blood pressure of 105 mmHg compared to those with a diastolic blood pressure of 76 mmHg.

Nonvalvular atrial fibrillation (NVAF) is a common and important controllable risk factor for stroke, increasing the risk of stroke about six times compared to those without atrial fibrillation (Hwang & Glass, 1999). Atrial fibrillation occurs when the atria of the heart quivers ineffectively leading to the formation of thrombus due to flow disturbances within the heart (Huey-Jun, Wolf, & Kelly-Hayes, 1996). Over two million adults in the United States have NVAF and this number is expected to increase as the population ages. This risk is greatest shortly after the onset of atrial arrhythmia. Recurrence of stroke is twice as common in those patients who experience atrial fibrillation (Bratina, Rapp, & Barch, 1997).

Diabetes mellitus is the most prevalent endocrinologic problem in primary care practice and has been identified as a risk factor for stroke (Gorelick, 1997). Diabetes may increase the risk of thromboembolic stroke through multiple and potentially synergistic mechanisms. According to Gorelick (1997) these include acceleration of large artery atherooclerosis via glycosylation-induced injury, adverse effects on both LDL and HDL cholesterol, and promotion of plaque formation through hyperinsulinemia.

There are factors that contribute to the increased incidence of stroke risk factors. Lifestyle factors such as cigarette smoking, alcohol use, physical activity, and diet have all been associated with a variation in stroke risk. Recognition of these lifestyle factors

are important to reduce the incidence of stroke, which has been increasing (Gorelick, 1997).

Smoking is an independent predictor of ischemic stroke with adjusted relative risks of 2.5 for men and 3.1 for women. Stroke risk was increased two-fold in heavy smokers (>40 cigarettes per day) compared to light smokers (<10 cigarettes per day). Even the effects of passive exposure to cigarette smoke have been found to increase the risk of progression of atherosclerosis (Howard, Wagenknecht, & Burke, 1998).

The mode of action by which cigarette smoking increases the risk of stroke is not entirely clear, but acceleration of atherosclerosis is one possibility. Cigarette smoking has been found to be an independent determinant of carotid artery plaque thickness and a substantial predictor of severe extracranial carotid artery atherosclerosis (Sacco, Roberts, & Boden-Albala, 1997). Other biological mechanisms by which cigarette smoking may impact stroke risk include increased blood coagulability, increased blood viscosity, and increased fibrinogen levels, enhanced platelet aggregation, and elevated blood pressure (Howard, 1998).

The role of alcohol as a risk factor for ischemic stroke is controversial and may be dependent on dose. Alcohol has a direct dose-dependent effect on the risk of hemorrhagic stroke, but the data on cerebral infarction are contradictory (Mullen, Simons-Morton, Ramirez, Frankowski, Green, & Mains, 1997). Some studies suggest that moderate alcohol consumption, up to two drinks per day, confer a protective effect in the risk of ischemic stroke. A J-Shaped relationship between alcohol and ischemic stroke has been observed with a protective effect in light drinkers and an elevated stroke risk for

moderate to heavy alcohol consumption when compared to non-drinkers (Pellegrinni, Pareti, Stabile, Brusamolino, & Simonetti, 1996).

Regular exercise has well-established benefits for reducing the risk of premature death and many conditions including cardiovascular disease. The beneficial effects have been predominately described among Caucasian populations, are more apparent for men than women, and generally described in the young rather than the older adults (Blair, Kampert, & Kohl, 1996).

The protective effect of physical activity may be partly mediated through its role in controlling various risk factors for stroke. Lack of exercise increases various risk factors for stroke. Blood pressure in African Americans is higher when exercise is not part of the treatment regimen (Broderick, Brott, & Kothari, 1998). According to Blair (1996), lack of exercise is also associated with a higher incidence of cardiovascular disease, less optimal control of diabetes, unhealthy dietary habits, and increased body weight. Other biological mechanisms are associated with physical inactivity, including increases in plasma fibrinogen and platelet activity, and reductions in plasma tissue plasminogen activator activity and high-density lipoprotein (LDL) concentrations (Williams, 1996).

Data suggest that diet may play an important role as a stroke risk factor. Dietary sodium intake is an important factor that may be associated with increased stroke risk. Specifically, increased sodium intake is associated with an increased risk of hypertension. Reductions in salt consumption may significantly lower blood pressure and could lead to a decrease in stroke mortality (Sacks, 1996).

Another important dietary component that may be associated with stroke is homocysteine. This amino acid is involved in methionine metabolism and is associated with dietary intake of folate and vitamin B12. The Framingham Study found that deficiencies in folate, B12 levels, and pyroxine accounted for the majority of elevated homocysteine levels increasing the risk for stroke (Gorelick, 1997). Dietary anti-oxidants, including vitamin C, vitamin E, and beta-carotene belong to a group of antioxidants called flavonoids. These scavengers of free radicals are thought to be associated with stroke risk reduction through the free-radical oxidation of LDL, a process that inhibits the formation of atherosclerotic plaques (Losonczy, Harris, & Havlik, 1996). Other dietary factors associated with a reduced risk of stroke include increased levels of potassium and strategies to reduce these risks. calcium (Gorelick, 1997). According to Losonczy (1996), green tea, and fish oils are associated with a decreased risk for stroke. Overall, dietary factors are not considered well-established risk factors for cardiac disease in general. Patients at risk for stroke will benefit from identification of risk factors for cardiac disease in general.

Statement of the Issue

Stroke is a commonly encountered problem with risk factors that are poorly understood by patients resulting in devastating disability and economic losses for patients, therefore, we are going to address risk factor identification and modification by the APN. The National Stroke Association's Multidisciplinary Consensus Statement (Gorelick et al, 1999) and the Health Belief Model (Becker, 1974), which emphasizes the role of barriers in the decisions patients make about seeking health care, are the

conceptual frameworks guiding the APN in making correct diagnoses and reducing barriers to treatment of stroke risk factors.

Purpose of the Project

The purpose of this project is to provide APN's in primary care with a clinical protocol for the accurate assessment and modification of risk factors for stroke. Use of the protocol will aid in improving accurate assessment and treatment of patients at risk for stroke. The barriers to seeking consultation for and compliance with risk factor treatment will be examined within the context of the Health Belief Model. Understanding patient and practitioner characteristics that have been identified as barriers to effective diagnosis and use of the NSA guidelines will assist the APN in forming an accurate risk factor assessment and modification treatment plan ensuring patient compliance.

Stroke is a preventable disease. Recognition of risk factors and modification of lifestyle factors are the keys to stroke prevention (Sacco, Wolf, & Gorelick, 1999). The APN has educational preparation and clinical training beyond the basic preparation required to become a registered nurse. APN's conduct comprehensive health assessments and possess advanced skills in the assessment of risk factors for stroke, diagnosis, and treatment of individuals, families, and communities for health problems such as stroke. APN's formulate clinical decisions to manage acute and chronic illness and promote wellness. Patient education, research, management, leadership, and emphasis in patient counseling and education and firm orientation in the healing, helping, and caring domain make them excellent practitioners at risk for stroke (Leonard, 1996).

Literature Review

This literature review will focus on several points that are critical to the APN in the understanding of problems treating and modifying stroke risk factors in primary care. There are many sources that elaborate upon these points and provide essential information for family practitioners treating patients at risk for stroke. This information is helpful for primary care providers seeking to eliminate barriers to effective recognition and treatment of stroke risk factors.

Pathophysiology of Stroke

Stroke occurs when there is a disruption of blood flow to an area of the brain. Disruption of blood flow can be caused by either an obstruction of the cerebral blood flow (ischemia) or rupture of the wall of a vessel supplying the brain (hemorrhage) (Bratina, Rapp, & Barch, 1997).

Transient Ischemic Attacks

Transient Ischemic Attacks (TIA's) are defined as focal disturbances in neurologic function that last less than twenty-four hours and leave no residual deficit. Common focal deficits include slurred speech, unilateral weakness, or numbness (Bratina, et al., 1997). Although only 10% of strokes are preceded by a TIA, approximately 35% of people experiencing a TIA will stroke within four years (Leonard, 1996). Treatment of TIA therefore is crucial to prevent cerebral infarction. Medical therapies aimed at decreasing platelet aggregation, clotting, and viscosity of blood are the most effective current therapies (Bratina, et al., 1997).

The Role of Early Recognition

There are different degrees of damage within the area of stroke, which correlate with loss of oxygenation. The penumbra is the area of moderately ischemic brain tissue surrounding an area of more severe ischemia. By enhancing the blood flow to the penumbra it is possible to prevent the spread of cerebral infarction (Lewandowski & Libman, 1999). In contrast, the area of complete infarction has had an oxygen deficit so severe that the brain tissue is injured irreversibly (Bratina et al., 1997).

The brain requires approximately 15% of the body's cardiac output and 20% of the body's oxygen consumption. Its energy is derived almost exclusively from glucose metabolism. Since the brain stores only a limited amount of glucose and glycogen, consistent cerebral perfusion is essential (Bratina et al., 1997). Neurons can be injured within minutes of complete cessation of blood flow. The extent of permanent injury in stroke depends on collateral flow and early reperfusion (Lewandowski & Libman, 1999). The penumbra is therefore the focus of treatment because it contains potentially viable cells that can be salvaged through proper management.

Cerebral ischemia or cerebral hemorrhage can cause stroke because of a sudden decrease of oxygen delivery to the brain (Bratina et al., 1997). Stroke is divided into two major categories according to underlying cause: ischemic (83%), caused by a blockage or reduction of blood flow in a cerebral artery, and hemorrhage (17%), caused by bleeding. Ischemic stroke is further classified into thrombotic and embolic subtypes (Broderick et al., 1998).

The Impact of Ischemic Stroke

Thrombotic strokes are caused by an obstruction of blood flow in an artery due to a pathologic process within that artery such as athrosclerosis which creates a site for a blood clot to form (Bratina et al., 1997). Thrombotic stroke is estimated to be responsible for two-thirds of all ischemic strokes. The atherosclerotic occlusion process in stroke is similar to that of coronary artery disease. Plaque develops within the intima of the vessel wall, vessel lumen size is reduced, and blood flow is impeded. Thrombus formation occurs as thrombogenic plaque is exposed to arterial blood flow. Platelet adherence, aggregation, and release of thromboplastin initiate the coagulation cascade resulting in insoluble fibrin formation. The fibrin traps platelets, red cells, and circulating proteins, which initiates formation of a thrombus (Saaco & Boden-Albala, 1997).

The reduction in blood flow to the brain results in hypoxia in the brain cells, leading to the clinical symptoms of stroke. Other causes of thrombotic stroke include inflammatory disorders, carotid or vertebral artery dissection, drug abuse, severe migraine, and hematologic disorders (Lewandowski & Libman, 1999).

Embolic stroke results when a thrombus or a component of plaque dislodges and circulates through the blood stream, eventually occluding a cerebral blood vessel. Emboli can originate in the heart during or after myocardial infarction or due to arrhythmia's, predominantly atrial fibrillation. Other causes of embolic stroke include sick sinus syndrome, infective endocarditis, nonbacterial endocarditis, mitral valve prolapse, congenital septal defects, and prosthetic heart devices (Anderson et al., 1995).

The Impact of Hemorrhagic Stroke

Intracerebral hemorrhage occurs when a vessel ruptures in the brain and accounts for 13% of strokes (Bratina et al., 1997). Intracerebral hemorrhage may be classified as primary or secondary. A primary intracerebral hemorrhage is caused by extravasation of blood from vessels into the brain parenchyma causing pressure to be exerted on brain tissue by the expanding volume of blood into the brain parenchyma or white matter (Leonard, 1996). The major risk factors for primary intracerebral hemorrhage are age, hypertension, alcohol abuse, and very low serum cholesterol. In young adults, drug abuse, vascular malformations, aneurysms, and coagulopathies are the most common causes. In middle-aged adults, metastatic and primary brain tumors and anticoagulation therapy are additional important causes (Abdulrauf, Furlan, & Anwad, 1999).

Recognition of Modifiable Risk Factors is Commonly Encountered in Primary Care

Despite recognition of modifiable risk factors for a first stroke and the availability of well-known treatments and modifications, sub-optimal control of the risk factors contribute to over 700,000 strokes in the United States per year (Broderick et al., 1998; Miller, Hill, Kottke, & Ockene, 1997). Hypertension remains one of the most prevalent and modifiable of the risk factors. Over 50% of the patients with sub-optimal control of hypertension demonstrate poor or partial adherence to their medical regimens (Hall, Ferrario, & Moore, 1997).

Observational epidemiological studies suggest that modification of life style related risk factors (smoking, alcohol, physical activity, and diet) can decrease the risk for stroke. With regards to cigarette smoking, the risk of ischemic stroke returns to that of non-smokers after 2-5 years of cessation from smoking (Hurt, Sachs, & Glover, 1997;

Pancioli, Broderick, & Kothari, 1997). The Agency for Health Care Policy and Research Guidelines for smoking cessation is cost-effective, and its recommendations should be followed (Hurt, Sachs, & Glover, 1997).

Heavy drinking increases the incidence of stroke and it has been estimated that 23,500 strokes per year could be prevented at savings of $1.18 billion if heavy alcohol consumption could be eliminated (Gorelick, 1997; Mullen, et al., 1997). Since some ingestion of alcohol, perhaps up to two drinks of red wine per day, may actually help decrease the risk of stroke, drinking in moderation should be recommended for most of the public who drink alcohol and have no health contraindications to alcohol use (Mullen et al., 1997 & Pellegrini et al., 1996).

In terms of physical activity, the benefits for stroke reduction have been seen for even light to moderate activities such as walking (Blair, Kampert, & Kohl, 1996; Broderick et al., 1998; & Gorelick et al., 1999). In Healthy People (2000), the United States Department of Health and Human Services targeted physical activity in its health objectives for health promotion and disease prevention. The aim by the year 2000 is to increase the proportion of people who engage in regular physical activity and reduce the proportion of those who engage in no leisure time physical activity, particularly among people aged 65 and older (Burt, Cutler, & Higgins, 1995).

Current guidelines recommend that Americans should exercise for at least thirty minutes of moderately intense physical activity on most days of the week with an emphasis on regular, moderately intense physical activity (Pate, Pratt, & Blair, 1995). Over a period of several months, progression to a level of activity that achieves cardiovascular fitness would be an ideal short-term goal (Mullen, et al., 1997; Pate, et al., 1995).

Wolf, & D'Agostino, (1996) published guidelines to promote a healthy diet for the United States Preventative Services Task Force. Dietary recommendations include: limit the intake of dietary fat (especially saturated fat) to <30% of total calories; limit the intake of dietary cholesterol to <10% of total calories; emphasize the intake of fruits and vegetables and products containing fiber; maintain caloric balance through diet and exercise; maintain adequate intake of dietary calcium; reduce the intake of dietary sodium, and increase the intake of beta-carotene and other antioxidants (Gorelick, 1997 & Sacks, 1996).

Underdiagnosed and Undertreated Stroke Risk Factors

Stroke is the number one cause of adult disability (AHA, 1997). In spite of the fact that several conditions and lifestyle factors have been identified as risk factors for stroke, physicians often fail to diagnose the condition (Miller et al., 1997 & NHLBI, 1997). The incidence of stroke is increasing (AHA, 1997). This trend is accompanied by an increase in the prevalence and less adequate control of key risk factors (Miller et al., 1997 & Rudd, 1995).

Morbidity

The cost of stroke has been estimated at $ 30,000,000,000 per year (Bergman, van der Meulen, Limburg, & Habbema, 1995 & Deaton, 1998). Employers and society in general experience economic losses in terms of loss productivity due to the disability of stroke (Crawley, 1996; Deaton, 1998; Stineman & Granger, 1998). Seventeen billion of stroke costs are estimated to be indirect costs (NSA, 1997; Stineman & Granger, 1998). The direct cost of stroke is measured in lost income and medical expenses. Direct costs include diagnosis, treatment, hospitalization, and rehabilitation. Direct costs are

estimated to be thirteen billion dollars (Deaton, 1998 & NSA, 1997). Indirect costs include loss of productivity, continued outpatient services, and community services (NSA, 1997; Stineman & Granger, 1998).

We are only beginning to understand how patients react to and feel about their stroke (Anderson et al., 1995 & King, 1996). Caregiver burden puts a strain on financial and personal resources. Approximately 50 – 75% of stroke survivors require help with mobility, activities of daily living such as meal prep and self care (King, 1996; NHLBI, 1997). Caregivers are most often female, either a spouse or a daughter of the stroke patient. Most are forced to give up something, either a job outside the home or time with their own family (King, 1996; Kraft & Kraft, 1998; NHLBI, 1997; Wojner, 1996). This burden and the cost of this burden are enormous (Kraft & Kraft, 1998).

Barriers to Diagnosis and Treatment

The majority of the general public does not recognize stroke symptoms or seek health care in response to stroke symptoms (AHA, 1997; NSA, 1997; & Pancioli et al., 1997). Multiple prevention and risk factor awareness resources have often been overlooked in the clinical settings as practitioners focus on "treatable" diseases (Gorelick, 1997). The process a stroke patient goes through when seeking health care is different from the process used by patients with other diseases (AHA, 1997 & Pancioli et al., 1997).

The success of an educational program depends on three things: the best message, the right audience, and the appropriate medium in which to convey the message (Carleton Bazarre, & Drake, 1996; NSA, 1997). Factors that motivate change in the population at risk for stroke need to be identified and evaluated ((Kothari, Sauerbeck, & Broderick,

1997; Pancioli et al., 1997). Practitioners often fail to adequately recognize and treat stroke risk factors, or fail to establish a satisfactory relationship with the patient. Both of which frequently result in patient non-compliance or discontinuation of treatment (Shelton & Gaines, 1995).

Strategies to improve patient understanding and compliance have been examined (Miller et al., 1997 & Wojner, 1996). Practitioners do not routinely address methods to improve compliance to chronic treatment regimens or preventative lifestyle changes in adult patients (Mullen et al., 1997 & Wojner, 1996.). Methods that can be employed to improve follow-up visits and compliance include reminders to patients, orienting patients to the clinic, educating patients about medications, and forming an agreement with the patient to return (Crawley, 1996 & Gorleick, 1997). Mullen et al., (1997) found that follow up visits more than 30 days from the initial visit for patients receiving counseling for nutrition, weight control, and blood pressure management was very effective in demonstrating improved outcomes.

Conceptual Framework

The Health Belief Model

The health belief model examines the relationship perception has on health prevention making it an ideal framework for stroke prevention initiatives. This model provides useful framework for intervention, especially in understanding and reducing barriers to care. The health belief model has been useful in predicting both health behavior before illness, such as willingness to undergo cancer screening, and health behavior during illness such as compliance with medical regimens or prescribed therapies

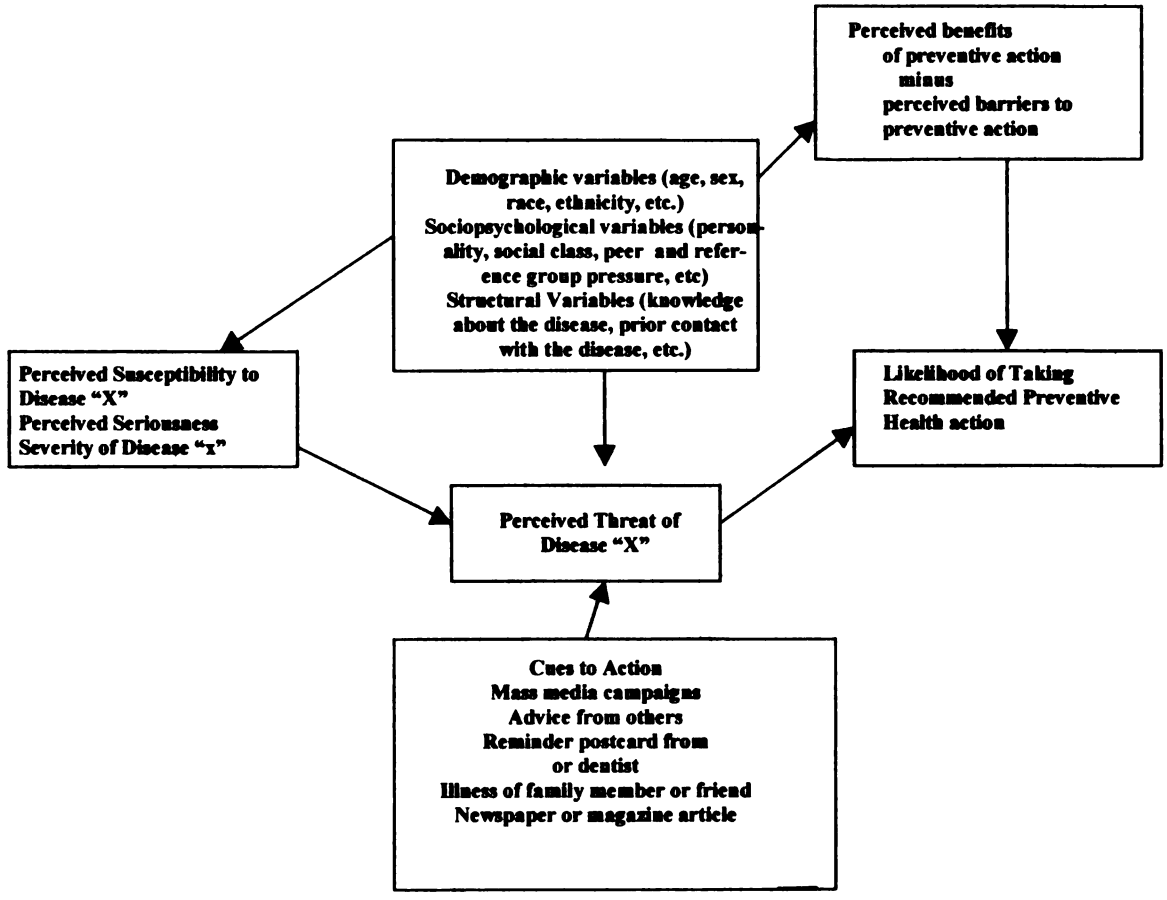
(Becker, 1974 & Rosenstock, 1974). According to Rosenstock (1974) practitioners can increase patient response by minimizing the barriers to action, increasing the opportunities to act, which will increase perceived benefits and provide cues to trigger responses. By assessing the barriers to compliance, the practitioner can individualize interventions to suit the particular needs of the patient (Becker, 1974). Other elements of the health belief model, such as cues to action, and perceived benefits of taking health related action, can also be remodeled by the practitioner for the requirements of individual patients (Becker, 1974).

The Health Belief Model developed by Hochbaum, Kegeles, Leventhal, and Rosenstock (Becker, 1974) was greatly influenced by Kurt Lewin's dynamic personality theory. These researchers believed that it is the world of the perceiver, and not the physical environment that determines what the perceiver will do. According to Rosenstock (1974), the theory focuses on the current dynamics confronting the individual, rather than on the historical perspective of his/her prior experiences. The model was initially proposed to explain preventive health behavior. It was later adapted to explain illness and sick role behavior such as compliance or lack of compliance with treatment plans.

The model proposes that an individual's subjective state of readiness to take action and engage in health related behaviors, relative to a particular disease entity, is a function of several factors (Rosenstock, 1974). In order for an individual to take action to avoid a disease he or she would need to believe (1) that he or she was personally susceptible to the disease, (2) that the event of contracting the disease would have at least a moderately severe effect on some component of the individual's life, and (3) that taking

a particular action would be beneficial by reducing susceptibility to, or severity of the disease. According to the model, the perceived barriers to taking health related action such as cost, convenience, embarrassment, and pain must be outweighed by the benefits of taking action such as reduction of the risk of occurrence or severity of the disease (Rosenstock, 1974). A cue to take action such as a perception of a bodily state (internal cue) must occur to trigger the appropriate health behavior. Various demographic, personal, social, and structural factors are viewed as modifying variables that can influence an individual's health-related perceptions, but are not considered to be direct causes of health action (Pierson, 1997). As shown in Figure 1, modifying variables such as age, sex, and social class alters the individual's perceptions of susceptibility. Cues to action, such as mass media campaigns, interact with the modifying factors to represent a perceived threat of disease to the individual. The likelihood that the individual will take health related action becomes a function of his/her perceptions of the benefits of the action minus the barriers to taking the action (Rosenstock, 1974).

Figure 1
THE HEALTH BELIEF MODEL as a predictor of preventive health behavior



Becker, M. (1974). The health belief model and sick role behavior. In M. Becker (Ed.), The health belief model and personal health behavior.

The Health Belief Model's emphasis on barriers to taking health related action can be helpful to the APN in understanding the reluctance of patients at risk for stroke to seek care and their frequent non-compliance after initiating medical consultation. Becker (1974) asserts that the various elements of the Health Belief Model associated with individual's decisions in the areas of seeking preventative health care also apply to compliance with prescribed regimens in persons already diagnoses with an illness. The Health Belief Model can be modified to facilitate the APN's understanding of patients at risk for stroke by expanding upon or emphasizing the patient's perceived barriers to treatment.

Wehner's Modified Health Belief Model For Stroke

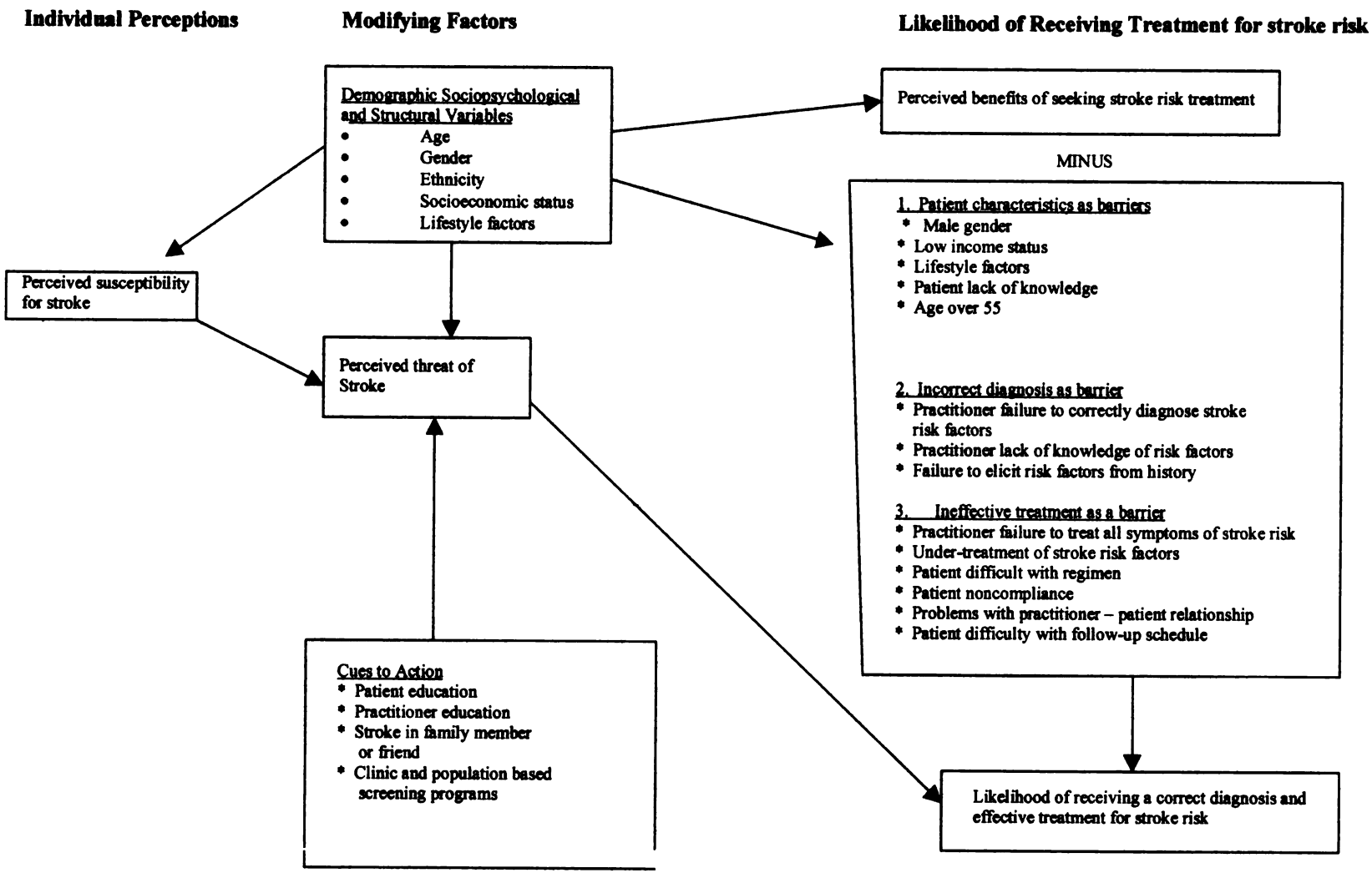
According to Becker, health care workers can modify the Health Belief Model to tailor interventions to suit the particular needs of each patient (1974). In addition, the APN can relate stroke specific information to the Health Belief Model's concepts of individual perception of severity, seriousness, and threat and can use patient demographic information such as age, sex, and socio-economic-status to predict which patients may be least likely to seek or comply with stroke risk factor treatment based on perceived benefits minus perceived barriers. As shown in Figure 2, a Modified Health Belief Model emphasizing variables specific to stroke patients and focusing on barriers to treatment.

The Modified Health Belief Model starts with the patient's perception of risk factors for stroke, which may be reduced due to lack of knowledge of the importance of life-style factors on risk. The patient may be aware that they have multiple risk factors, but be unaware of strategies to improve their health status. According to the NSA (1996)

48% of Americans could not name one sign or symptom of stroke and 71% could not identify two risk factors for stroke. Many stroke victims never perceived personal susceptibility and therefore failed to recognize cues to action precluding the possibility of diagnosis and treatment (Gorelick, 1997). In the opinion of this author, the patient's lack of perception of susceptibility, severity and threat of the disease may actually constitute a barrier to treatment.

The modifying factors which are thought to influence an individuals health related perceptions regarding stroke but are not direct causes of health related action are also related to possible barriers of health care seeking. Some important demographic variables of this population are age, sex, and ethnicity.

Figure 2: WEHNER'S MODIFIED HEALTH BELIEF MODEL
Relative to Health Care for Stroke Risk Factors



There are cues to action that focus on the populations most at risk. Mass media campaigns promoted by the National Stroke Association and the American Heart Association have been effective in improving public awareness. Public education programs, wellness programs, screening programs, and provider education programs are recommended by the NSA (1996) to reduce the number of stroke victims. The Modified Health Belief Model includes specific cues to action for patients and their practitioners.

The likelihood that patients will seek treatment according to the model depends upon the perceived benefits of seeking medical care minus the barriers, actual and perceived, to seeking treatment. There are several barriers to identification, diagnosis and treatment of stroke risk factors. These barriers are grouped into three categories: patient characteristics, control of risk factors, and effective treatment.

An examination of the role of preventive health behavior using the Modified Health Belief Model is helpful in understanding how four specific barriers to diagnosis and treatment (gender, socio-economic status, lifestyle factors, and practitioner/patient relationship) effect the patient's decision to seek or comply with care. According to Kirscht (1974) behavioral decisions are made to avoid negatively valued outcomes. The health care action to be taken must reduce the threat of disability to the patient. The personal threat inherent in an illness is weighed against the threat of role loss that may occur if the illness is actually found to be present. In health belief terms, the cost of a course of action to reduce a threat becomes important when evaluating a given disease, in this case, stroke.

Male gender acts as a barrier to stroke awareness and diagnosis in the Modified Health Belief Model because the risk of stroke may be perceived as a threat to the

integrity of male roles. Males also have a higher incidence of stroke, compounding this factor. According to Kirscht (1974) the threat of an illness is weighed against the threat of role loss, and in early childhood boys clearly learn to appear unafraid to deny symptoms. This may make them less likely to present to the APN for assessment and treatment of stroke risk factors or symptoms.

Lifestyle related factors such as smoking, alcohol intake, physical activity, and diet function as a barrier to treatment in the Modified Health Belief Model. Counseling and teaching about diet, exercise, and lifestyle changes can constitute very adequate treatment. The patient may never have the full benefit of therapies if they do not present for treatment, or if the practitioner fails to diagnose them, or under treats them because they are unaware of all lifestyle factors.

Low income status of patient's functions as a barrier in the Modified Health Belief Model by reducing the perceived value of possible benefits of treatment. Kirsch (1974) asserts that it may be that situational barriers that become chronic such as poverty, lack of transportation, family problems, negative experiences with agencies and providers lead to pessimistic beliefs and low motivation. Situational factors such as low income may create negative orientations that serve as rationalizations for failure to seek care. These situational factors enter into health care decisions and need to be incorporated into the psychological benefits and barriers to seeking care (Kirsch, 1974).

Unsatisfactory practitioner/patient relationship acts as a barrier to treatment of stroke risk factors in the Modified Health Belief Model with the indirect result manifested in the patient's failure to comply with treatment regimens. According to Becker (1974) in circumstances where the practitioner is formal, rejecting, controlling,

disagrees with the patient, or interviews the patient at length without subsequent feedback, patient non-compliance often results. When patients perceive lack of warmth in the practitioner/patient relationship and fail to receive an explanation of the problem, non-compliance is high. When the patient is satisfied with the initial contact, perceives the practitioner as friendly, and feels that the practitioner understands the complaint, compliance is better (Becker, 1974).

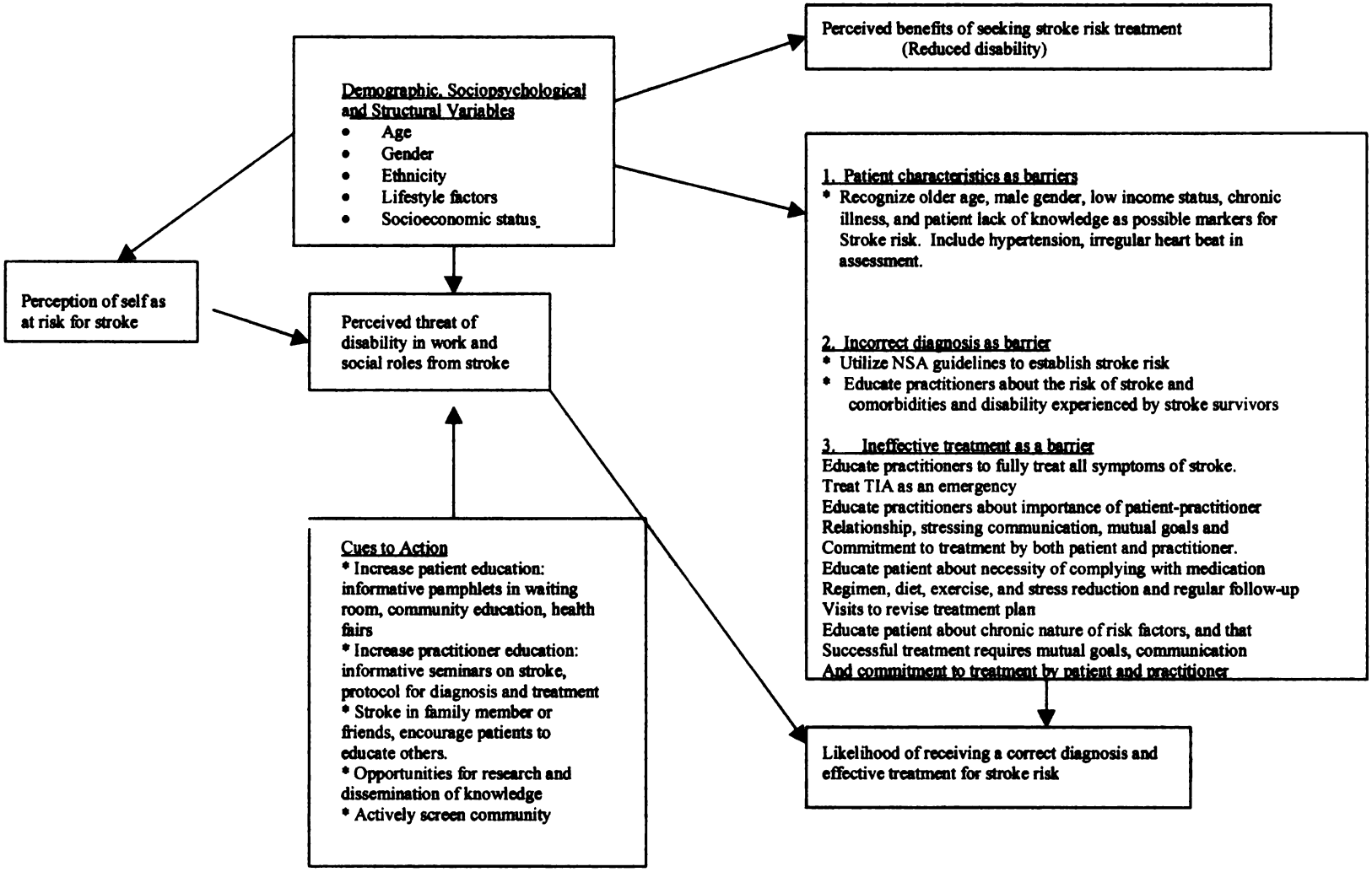
The Interventional Health Belief Model

Figure 3 illustrates the interventional Health Belief Model. The interventional model illustrates the concepts of the original Health Belief Model to suggest interventions at each stage of the model to improve diagnosis and treatment of patients at risk for stroke. This model begins with the patient's perception of him/herself as related to stroke risk. This is the result of the APN's intervention of screening and educating for stroke risk. In addition, the patient perceives the threat of stroke as increased disability in work and social roles. Therefore the failure to consult and receive treatment would be perceived by the patient to result in increased disability. The modifying variables of age, gender, ethnicity, lifestyle, socioeconomic status and prior knowledge of stroke risk remain unchanged from the previous model.

Specific APN interventions to formulate effective cues to action are provided in the Interventional Health Belief Model. Increasing patient and practitioner education, generation of research, informative articles, public health awareness campaigns, and active screening of clinical and community populations are suggested as means to provide the impetus to act upon improving assessment and modification of stroke risk by the APN.

Figure 3: WEHNER'S INTERVENTIONAL HEALTH BELIEF MODEL
To Improve Identification and Treatment of Stroke Risk Factors

Individual Perceptions **Modifying Factors** **Likelihood of Receiving Treatment for Stroke Risk**



The perceived benefits of seeking treatment in the Interventional Model are improved awareness of stroke risk, improved health status, and a reduction in disability. The benefits are obtained after subtracting the costs of three levels of barriers. APN interventions for reduction of barriers are detailed for each of these levels. Practitioners are advised to recognize male gender, ethnicity, and lifestyle factors of diet, smoking, physical activity, and lack of patient knowledge as indicators of stroke risk.

Advanced Practice Nurses as Counselors and Educators

APN's are trained to be excellent patient educators specializing in knowledge transmission as a means of empowering patients in their own self care (Snyder & Mirr, 1995). Health education to the APN is a communication of facts designed to provide a knowledge base for health activities which are aimed at increasing the ability of patients to make informed decisions about their personal well being.

A successful program to identify and reduce risk factors for stroke is centered upon lifestyle changes that involve diet, exercise, blood pressure control, and behavioral modifications. Patient education and counseling are the major focus of the APN's interventions to reduce risk factors for stroke (Miller et al., 1997). Education and counseling by the APN facilitate behavioral change. Patient education and counseling assists the patient to understand his/her risk factors for stroke, and prevent complications. APN's, with their emphasis on teaching and counseling are particularly effective in teaching patients to manage their own healthy lifestyle to prevent stroke.

The Healing Domain of the Advanced Practice Nurse

Shelton and Gaines (1995) found a strong relationship between an individuals perception of stroke and his/her likelihood to seek medical care. Recognition of stroke is the only factor associated with early presentation of health care (Daley et al., 1997). APN's, according to Pierson (1997) are more flexible in their roles with patients than other practitioners and their interactions tend to be more subtle and complex. These differences in style, which make APN's adept at working with at risk patients, can be attributed to the APN's culture as a nurse, and to the healing, helping, and caring domains.

The healing domain of the APN involves several competencies under the categories of creating, valuing, attending, and providing (Kraft & Kraft, 1998). The specific skills that comprise these competencies are; creating a healing climate, maintaining self care, and giving support, contributing self, protecting dignity, maintaining confidentiality, providing sensitive humor, providing sense of presence, detecting feelings and concerns, monitoring own emotions, risk taking, aiding decision making, communicating through touch, providing emotional and informational support, and preserving personhood and comfort of the patient (Daley et al., 1997 & Pierson, 1997). These activities of the healing domain communicate caring and helping from the APN to the patient. This builds the foundation for a therapeutic relationship necessary for identifying and impacting risk factors for stroke.

Ineffective treatment as a barrier can be reduced by APN's educating themselves and other practitioners to fully assess and treat all risk factors. The importance of the patient/practitioner relationship stressing communication, mutuality, and commitment to

the treatment regimen should be emphasized to patients and practitioners. Patients should be educated as to the chronic insidious nature of stroke precursors and that successful treatment depends on compliance with the treatment plan. This focus on patient empowerment through education, along with the APN's competency in the healing, helping, and caring domain make the APN an excellent practitioner for patients at risk for stroke. Early identification and recognition of stroke risk factors and acute stroke can reduce the burden of disability caused by acute stroke.

Protocol for Assessment of Stroke Risk

The Stroke Risk Protocol is designed to screen adults over the age of 18 for risk of stroke. For the purpose of this project the target audience will be adults over the age of 40 as risk begins to rise after age 45. Three key elements of the screening include: review of an individual's risk factors, a blood pressure and pulse check, and teaching the warning signs of stroke with the emphasis that stroke is an emergency that demands immediate call to "911". APN's , with their expertise in assessment and patient education, are ideally suited to conduct stroke risk screenings designed to make an impact on the incidence, morbidity and mortality of stroke. The stroke assessment contains eight parts. The first six parts are used to collect specific information that will help to determine the individual's risk for stroke. Part 7 identifies the person's risk for stroke and gives a recommendation. Part 8 is a vital part of the public education plan to increase awareness of the signs and symptoms of a stroke.

Completing the stroke risk protocol

Stroke Risk Protocol has been designed to screen adults over the age of 40 for the risk of stroke. A risk profile based on the screening is developed with recommendations for follow-up and continued treatment with a primary care provider. The risk screen assessment should take about eight minutes to complete. These explanations and notations will assist the provider when completing the form. It is designed to be used in an office setting and health screening by nurses at all educational levels supervised by the APN. The patient can complete the demograpahic section.

History for known and established high risk factors

1. **Do you have high blood pressure?** Use the following guidelines from the 1997 Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure from the National Institutes of Health, National Heart, Lung, and Blood Institute, National High Blood Pressure Education Program:

Blood Pressure Recording	**Systolic (mmHg)**		**Diastolic (mmHg)**
*Optimal +	<120	and	<80
*Normal	<130	and	<85
*High-Normal	130-139	or	85 –89
*Hypertension ++			
Stage I	140- 159	or	90 – 99
Stage II	160-179	or	100-109
Stage III	>180	or	>110

+ Not taking antihypertensive drugs and not acutely ill. When systolic and diastolic pressures fall into different categories, the highest category should be selected to classify the individual's blood pressure status.

++ Based on the average of two or more readings taken at each of two or more visits after an initial screening. Evaluate within one week depending on the clinical situation.

The "High Normal" recordings of risk may require lifestyle modifications, and/or drug therapy depending on the number of other risk factors. Hypertension with Stage I, II, or III may require lifestyle modifications and drug therapy.

2. **Do you take medication for high blood pressure?** Lifestyle changes, medications, diet, and activity may help reduce blood pressure. High blood pressure may last a lifetime. In combination with aging and atherosclerosis with thickening of the arterial walls, hypertension may be difficult to control. It may also be difficult to control fluctuations in blood pressure with medications, such as, in times of stress, illness or hypertensive emergencies.
3. **Do you have atrial fibrillation?** About 15% of all people who have a stroke have atrial fibrillation. Men are affected more than women. As the heart contracts irregularly, blood clots can form, enter the circulation and block cerebral circulation. Symptoms may include an irregular pulse, shortness of breath, dizziness or lightheadedness. An irregular pulse should be evaluated for atrial fibrillation and treatment to reduce the risk of stroke.
4. **Have you ever been checked for or been told that you have narrowing of the arteries to the brain?** Carotid artery disease or narrowing of the vessels to the brain restricts cerebral circulation and increases the risk for stroke. Patients who have experienced a TIA and who have carotid stenosis may benefit from surgical intervention.
5. **Have you had a heart attack, heart bypass surgery, angioplasty or other heart disease?** Heart disease that includes congenital heart defects, congestive heart failure, rheumatic heart disease, valvular heart disease, arrhythmias, cardiomyopathy,

angina, heart surgery, angioplasty or myocardial infarction can increase the risk of stroke. These conditions are considered "non-modifiable" risk factors.

6. **Have you had a previous stroke, mini-stroke or TIA?** History of stroke may increase the risk of stroke up to ten times. Extra diligence in adhering to a medical plan of prevention is required.
7. **Do you have diabetes mellitus?** Individuals with diabetes may have problems with obesity, elevated cholesterol levels, hypertension, poor diet, small vessel changes which has the potential to increase their risk for stroke. Uncontrolled diabetes mellitus is an independent risk factor for stroke and may increase the risk two to four times. Damage may result from the overall hypermetabolic state and the concurrent hyperglycemic state.

8,9 **Have you ever smoked cigarettes?** Tobacco use has been shown to be an independent risk factor. Smoking causes a rise in blood pressure each time a person smokes a cigarette. Once the vessels have been damaged from the nicotine there is no easy way to determine recovery from cigarette smoking.

History for significant but slightly lower risk factors

10. Has a family member under the age of 45 had a stroke or heart attack? Individuals who have had a family member experience a stroke before the age of 45 may be at greater risk for stroke. Evaluation of the person's family medical history may reveal multiple risk factors that help to prevent or explain early stroke. Recommendations to modify and individual's lifestyle is important.

11. Do you consume more than two ounces of alcohol on a daily basis? Drinking more than two ounces of alcohol at one time, or excessive drinking,

raises blood pressure which increases the risk of stroke. In particular, binge drinking and other forms of alcohol abuse increase the risk of stroke. If you stop drinking, your stroke risk will drop significantly within two years.

12. Do you have a cholesterol level greater than 200? Increased levels of cholesterol above 200 mg/dl may be associated with atherosclerosis. Excessive levels of serum cholesterol that make up low-density lipoproteins (LDL) can build up in the arteries. High-density lipoproteins (HDL) are the "good" lipoproteins and carry cholesterol back to the liver for removal. According to the National Heart, Lung, and Blood Institute, a cholesterol level of 240 mg/dl or greater urns twice the risk of heart disease when compared with a 200 mg/dl. For smokers, this risk increases twenty fold.

History of uncommon but important risk factors

13. Do you take birth control pills? Women in their childbearing years, who use birth control pills and smoke, have a significant increase in stroke incidence and its relative risk.

14. Do you have Sickle Cell Anemia? Sickle Cell disease is an inherited blood disorder that affects about 90,000 Americans, mostly African-Americans. The patient has an abnormal hemoglobin and distorted erythrocytes with clumps that obstruct blood vessels and leads to vaso-occlusion, infarction, and stroke.

15. Do you use one or more of the following drugs: Cocaine, **Crack, Heroine, Amphetamines?** The use of illicit drugs among young adults may contribute to the increase in stroke. Each drug has unique side effects and complications. Drug combinations are even more difficult to assess for risk of stroke.

Assessment

Blood Pressure:

It is important to select the correct size blood pressure cuff, use proper technique and have the participant in the seated position to record the blood pressure (BP). The bladder within the cuff should encircle at least 80% of the arm.

Pulse:

Take the pulse measurement from the right or left radial artery for one full minute and record. Note the rhythm for regular or irregular "beat". This will factor into the final risk evaluation.

Identification of risk for stroke and recommendation

Stroke Risk Screening was designed to screen adults over the age of 18 for the risk of stroke. A risk profile based on the screening is developed with recommendations. The recommendations are made with preliminary findings which can change after follow-up with their healthcare provider. Findings of "no risk" of stroke is also no guarantee, only that the information did not indicate a risk for stroke.

Low Risk for Stroke: Indicates that the participant was under the age of 55 and responded **"NO"** to questions 1 through 15 (self-reported risk factors). The individual was **not** identified to have an irregular pulse rate, or a measured Systolic BP> 140 or a Diastolic BP >90. The recommendation given is that the patient continue to evaluate his/her risk level at regularly scheduled appointments.

Moderate Risk for Stroke: All participants over the age of 55 are at moderate risk. The risk for stroke doubles with every decade over 55. This category is checked

even if the participant has no self-reported risk factors and does not have an irregular pulse or a measured Systolic BP>140 or a Diastolic >90. Participants up to age 64 are at moderate risk with one self-reported risk factor, or an identified irregular pulse, or a measured Systolic BP>140, or a Diastolic >90. The recommendation is continued follow-up for evaluation of the education, teaching, and recognition of stroke symptoms.

High Risk for Stroke: This is the group age 65 or older with one self-reported risk factor, or any age with 2 or more risk factors. The recommendation is that they begin modifications today to reduce their risk.

STROKE RISK FACTOR SCREENING

Site and address of assessment:_____ Date:_____

Part I - Demographics

Name: (last)_____ (first) _____ (mi.)_____

Gender: ___Male ___Female

Address: _____ City: _____

State: ___ ZIP: _____ County: _____ Phone: _____

Part II – History for known and established high risk factors for stroke

1. Do you have high blood pressure? __yes __no

2. Do you take medication for high blood pressure? __yes __no

3. Do you have a history of abnormal heart rhythm (atrial fibrillation)? __yes __no

4. Do you have narrowing of the arteries to the brain? __yes __no

5. Have you had a heart attack or heart surgery? __yes __no

6. Have you had a previous stroke, mini-stroke, or TIA? __yes __no

7. Do you have diabetes or do you take medication for blood sugar? __yes __no

8. Have you ever smoked cigarettes? __yes __no

9. Do you currently smoke cigarettes? __yes __no

Part III – History for significant but slightly lower risk factors for stroke

10. Has a family member had a stroke or heart attack before age 45? __yes __no

11. Do you drink more than two ounces of alcohol each day? __yes __no

12. Do you have a cholesterol level greater than 200? __yes __no

Part IV – History of uncommon but important risk factors for stroke

13. Do you take birth control pills? __yes __no

14. Do you have Sickle Cell Anemia? __yes __no

15. Do you use cocaine, crack, heroin, or amphetamines? __yes __no

Part V – Assessment
Blood pressure recorded sitting: _____/_____ ____right arm or ____left arm

Radial pulse rate X 60 seconds: _____ Irregular pulse rate? __yes __no

Part VI – Age and ethnicity
Date of birth ____/____/____ Age in years: _____

___African American ___Caucasian ___Hispanic ___Asian/Pacific Islander

___ American Indian ___Other and unknown.

Part VII – Identification of risk for stroke and recommendation

1. ___**Low risk for stroke:** Under the age of 55, responded "no" to questions 1-15, and was not identified to have an irregular pulse or a measured BP > 140/90.
   Recommendation: Take this completed assessment to your healthcare provider at your next appointment.
2. ___**Moderate Risk for Stroke:** Age > 55 with no self reported risk factors, and no risk factors identified on assessment **or** age up to 64 with one self reported risk factor, or an irregular pulse rate, or a measured BP > 140/90.
   Recommendation: Notify your healthcare provider within one week with the results of your screening.
3. ___**High Risk for Stroke:** Age > 65 with one self reported risk factor, or an irregular pulse rate, or BP > 140/90 **or** any age with two or more risk factors.
   Recommendation: Notify your healthcare provider <u>today</u> with the results of your screening and request and appointment.
4. ___Presents with warning signs of stroke or TIA
   Recommendation: Call "911" immediately! Individual signs here that she received this recommendation.

Signature_____

Part VIII – The warning signs of stroke

- **Weakness, numbness, or paralysis of the arms or legs**
- **Sudden blurred vision or blindness in one eye**
- **Difficulty speaking or slurring of speech**
- **Severe headache with sudden onset that occurs without apparent reason**
- **Loss of balance or falling without any apparent reason**

Individual was taught the warning signs of stroke and the need to seek treatment **immediately.** __yes

Signature of healthcare provider _____Title_____

Evaluation

The goals of treatment for stroke risk factors are reduced disability from stroke, increased awareness of personal risk factors, and improved overall health status. It is important that the patient and practitioner have mutual goals identified in the treatment plan.

This protocol needs to be tested to see if it is valid and useful in primary care. A small local sample could be obtained by a few APN's in primary care. A questionnaire would be useful in identifying the utility of the tool. The objective of the small sample would be to test for usefulness in practice as a tool to identify patients at risk for stroke to begin intervention early. Baseline demographic information could also be compiled. Refinements and adjustments to the tool would be expected.

A large, longitudinal study would provide a large database to identify stroke risk in a large group of patients. The impact of early identification and intervention would be studied throughout the lifespan. The hypothesis to be tested is does knowledge of risk factors make a difference in the incidence of stroke? A longitudinal study with two identified groups followed for ten years is recommended. The groups would be those who have received education about stroke risk factors and those who have not. Tow outcome measures would be stroke incidence and functional outcomes. The larger question to answer is will knowledge of risk factors make a difference in stroke incidence and functional outcomes?

There are many opportunities to integrate this into the community. May is National Stroke Month. Some examples would be parish nurse partnerships, health

screenings, Advanced Cardiac Life Support courses, wellness programs, and collaboration with primary care practices.

Conclusion

It is appropriate and cost effective for APN's in primary care to assess and treat stroke risk factors. Identification and elimination of barriers to diagnosis and treatment and use of the National Stroke Association Stroke Screening Tool will enable the APN in primary care to more effectively evaluate and treat their patients at risk for stroke. Prevention is the key to disabling the disability from stroke. APN's can have a substantial impact on the tremendous personal and financial burden of stroke in this country.

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