

## **A Stroke Reduction Health Plan for Older Adults in Rural Sussex County, Delaware**

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### **Abstract**

Stroke is a leading cause of death and disability among adults age 65 and over in the United States. Modifiable risk factors for stroke include: obesity, poor nutrition, and lack of exercise. Sussex County, Delaware has the highest stroke rate among older adults in the state. Twenty-five percent of the population in Sussex County are 65 and over and about 70% of adults are overweight or obese. Consistent with the social ecological framework, the Stroke Population Risk Tool may be used at the individual level to identify those at an increased risk for stroke and to create individualized stroke specific education. At the community level, local nutrition, fitness, and senior services may be utilized - with older adults at the highest risk profile participating in a 12 week stroke education program focused on risk reduction behaviors, nutrition and exercise classes. At the policy level, the Walkability Assessment Tool may be utilized to encourage local municipalities to identify areas of the county which lack safe spaces to be physically active and to develop a plan to create a more exercise conducive environment. Taken together, the proposal discusses an implementable plan that may, in the long-term, effectively reduce the stroke rates of older adults in Sussex County and allow for the early identification of those at the greatest risk for stroke.

### **Introduction**

Cerebrovascular accidents (CVA) are the fifth leading cause of death in the U.S., associated with long-term disability and over \$34 billion in health care costs.<sup>1</sup> Though an estimated 80% of strokes are preventable, about 800,000 new or recurring strokes occur every year.<sup>2</sup> Deaths from stroke were declining, but the rate of decline has slowed in recent years with an uptick in deaths in 2013. This may be due to increases in life expectancy, obesity, reduced health care access, as well as an unhealthy diet, and physical inactivity.<sup>2</sup>

Over 25% of the population in Sussex County, Delaware is over the age of 65.<sup>3</sup> Delaware is an attractive location for retiring baby boomers and other older adults with low overall tax rates, a central location and tourist attractions such as beaches.<sup>4</sup> By 2040 there is a projected increase of more than 50% in the 65 and older population.<sup>5</sup> Among the oldest old (age of 85 and over), population growth is expected to double to more than 18,000 individuals by 2040.<sup>6</sup> The risk of stroke increases exponentially with age; stroke prevalence is about 5.7% in 60-79 year olds and 14-15.5% among adults age 80 and over.<sup>6</sup>

In addition to age, other primary risk factors for stroke are diabetes, hypertension and hyperlipidemia.<sup>7</sup> Compared to their older adult counterparts in other areas of the state, Sussex County has the largest population of obese and overweight adults with elevated rates of diabetes (28.2%), hyperlipidemia (64.8%), and hypertension (64.2%).<sup>8</sup> Older adults in Sussex County also have lower physical activity rates (with fewer than half of residents reporting regular exercise) and poorer nutrition (26.5% consume recommended daily servings of fruits and vegetables).<sup>8</sup> This may be due, in part, to fewer opportunities for exercise, an increase in fast

food restaurants across the county, and a decrease in grocery stores supplying fresh fruits and vegetables.<sup>8</sup>

Access to quality health care may also be a barrier for some older adults in the county. About 20% of communities in the US are rural, but fewer than 10% of physicians practice in rural areas.<sup>9</sup> As a designated Health Professional Shortage Area (HPSA), Sussex County has over 3,500 people per primary care provider (PCP). Of those, 67.5% accept new Medicare patients which equates to an average 17 day wait time for an established patient and a 45 day wait time for a new patient.<sup>4</sup> Some older adults also have limited access to reliable transportation. Rural populations must travel greater distances to reach healthcare facilities, particularly specialists, and there is often inadequate public transportation.<sup>9</sup> In a community health survey of the three hospital systems in Sussex County, lack of reliable transportation was repeatedly highlighted as a considerable barrier to healthcare.<sup>4</sup> Access to quality healthcare is associated with access to clinical preventative screenings and services and overall improved mortality.<sup>10</sup> Thus, reduced access to care puts patients at an increased risk for stroke.

Given these individual, community and policy-level factors influencing stroke risk and access to quality health care among older adults in Sussex County, this paper utilizes a social ecological framework to begin to develop a tailored health plan for Sussex County, Delaware. Consistent with current work emphasizing the need for increased collaboration between public health policy and community level resources to combat the multilevel factors contributing to chronic disease, this paper provides recommendations for multi-level interventions which may be used to effectively reduce the risk for stroke in the local community.<sup>11</sup>

## Health Plan

Using the ecological perspective as a framework, the primary outcome of this health plan is to decrease stroke prevalence from 5.5% to less than the national average of 4% within 5 years.<sup>8</sup> As outlined in Table 1, this will require that we target seniors at the highest risk for stroke and establish a successful health plan that integrates individual, community, and policy-level factors and promotes healthy behaviors by the use of a 12-week stroke risk prevention program, improved nutrition, and increased physical activity.

Table 1. Stroke reduction plan for Sussex County.

	<b>Individual Level</b>	<b>Community Level</b>	<b>Policy Level</b>
<b>Outcome</b>	Identify individuals at highest risk for stroke. Institute individualized, patient focused stroke risk reduction health plan. Refer individuals at risk of stroke to appropriate community resources.	Establish a 12-week stroke risk reduction workshop. Improved nutrition by improving access to healthy foods among seniors. Improved physical fitness among seniors	Determine environmental factors impeding access to physical activity and nutritious foods. Improve the utilization of public areas for walking and exercise
<b>Performance Measure</b>	Number of individuals screened for stroke using SPoRT.	Number of individuals participating in 12-week stroke risk reduction workshop.	Number of Sussex municipalities using the Walkability Assessment Tool.

	Number of individuals participating in stroke risk reduction health plan. Number of individuals referred to community-based activities.	Number of individuals participating in community-based nutrition programs. Number of individuals participating in physical fitness classes.	
<b>Strategy/ Tactics</b>	Use of SPoRT to identify individuals at risk for stroke. Develop individualized stroke risk reduction health plan based on SPoRT score. Provide individuals with a list of community resources available.	Initiate a 12 week education workshop comprised of stroke education on risk factors and behavioral risk reduction strategies, nutrition* and exercise** interventions Continued follow up with health coaches after the 12-week workshop to encourage continued compliance with health plan Referrals to community transportation services to ensure access to doctor's appointments, nutritious meals, and exercise opportunities	Utilization of the Walkability Assessment Tool

*Notes.* SPoRT= Stroke Population Risk Tool \* Nutrition interventions include: (a) establish a community-based senior nutrition program, (b) weekly nutrition classes focused on a low sodium, low cholesterol, well balanced diet; simple meal preparation; healthy food samples; and where to obtain fresh ingredients, (c) referrals to meal delivery services (Meals on Wheels, local grocery delivery services, mobile grocery stores). \*\* Exercise interventions include: (a) 20-50-minute choreographed exercise sessions three time a week, (b) referrals to community fitness centers and exercise programs offered at local senior centers.

## Outcomes

The individual level outcomes are to: 1) identify individuals at an increased risk of stroke using the Stroke Population Risk Tool (SPoRT), 2) institute individualized, patient-focused stroke risk health plans, and 3) refer at risk individuals to the appropriate community resources. The community level outcomes are to: 1) establish a 12-week stroke risk reduction workshop, 2) improve nutrition by improving access to healthy foods among seniors, and 3) improve physical fitness among seniors. The policy-level outcomes are to: 1) determine environmental factors

impeding access to physical activity and nutritious foods and 2) improve the utilization of public areas for walking and exercise.

## **Performance Measure**

The Stroke Population Risk Tool (SPoRT) is a valid and reliable measure of stroke risk in this population (C-stat of 0.85 with a 0.83-0.86 95% CI for men and 0.87 with a 0.85-0.88 95% CI for women).<sup>12</sup> This on-line questionnaire can be completed in-person or over the phone with a health care worker every two years or during a community-based health screening such as those used for hypertension screenings.<sup>12,13</sup> The SPoRT uses age, sex, BMI, and self-reported health behaviors (smoking, alcohol, fruit and vegetables, leisure physical activity, stress), sociodemographic factors (country, education level), and disease and immobility factors (history of diabetes, heart disease, previous stroke, hypertension, dementia, cancer, activity limitations) to calculate a maximum score.<sup>12</sup> The SPoRT behavior score ranges between 0-9 for men and 0-11 for women. Each point increase in score is associated with a 12% increase in stroke risk for men and a 14% increase in stroke risk for women.<sup>12</sup>

As individual-level health behaviors are difficult to change, referrals to community-based programs should be well-documented and formal follow-up plans should be implemented to ensure adherence. Additional calls from a health care professional are recommended if the older adult does not use the community programs as recommended with a discussion of barriers (e.g., transportation) to program use. Community-level measures are to be collected monthly by quantifying the number of individuals participating in 12-week stroke risk reduction workshops, community-based nutrition programs, and in physical fitness classes with analyses on attrition, partial completion, and interviews with older adults in the program for quality improvement. At the policy level, measures will consist of the number of Sussex county municipalities using the Walkability Assessment Tool.

## **Strategy/Tactics**

### **Individual Level**

After identifying at-risk older adults, providers/health coaches/trained healthcare workers will work one-on-one with patients to encourage healthcare autonomy and foster compliance with the stroke risk reduction health plan.<sup>14</sup> This plan will directly address the patient's SPoRT score as well as direct the patient to applicable community resources in order to encourage healthy behaviors. Greater patient buy-in will be encouraged through evidence-based practice behavioral modification strategies such as goal setting, the establishment of a social network in support of the new healthier behaviors, self-reward and positive self-talk, as well as structured problem solving to help prevent relapse into less healthy behaviors.<sup>15</sup> A recent study found that the most influential health education approaches are tailored to the individual patient rather than generic behavioral materials created for the general population. Not only are such individualized approaches more relevant to the patients, but they can also be tailored to their level of health literacy.<sup>16</sup>

### **Community Level**

At the community level, individualized education and a supportive social network are enhanced through educational programs geared toward the elderly living at home. Programs are modeled

after Jeon and Jeong's stroke primary prevention program which consisted of 12 consecutive weeks of stroke education on risk factors and behavioral risk reduction strategies, weekly nutrition classes, and exercise classes three times a week.<sup>17</sup> The first six weeks will focus on managing stroke risk factors such as elevated BMI, hypertension, dyslipidemia, etc., thus providing a strong foundation for the second six weeks which focuses on health risk behavior reduction such as stress and obesity management. Jeon and Jeong's stroke primary prevention program significantly reduced blood pressure, blood sugar, lipid levels, depression score, and BMI among the rural older adult participants.<sup>17</sup> Following completion of this 12 week program, health care coaches will continue to follow these patients and encourage utilization of community wide nutrition and fitness programs. An important barrier for many older adults in rural areas is lack of transportation. Without access to a vehicle or public transportation older adults will be unable to participate in community programs and are at risk for social isolation and dependence.<sup>18</sup> This will be ameliorated through referrals to organizations providing reduced rate transportation to local shopping, community centers and events, pharmacies and other medical facilities for seniors.<sup>19-22</sup>

### **Public policy level**

On a policy level, the University of Delaware's Walkability Assessment Tool, which is a three-step process engaging local stakeholders in active workshopping and auditing, will be used to aide local governments in the assessment of the strengths and weaknesses of their county's degree of walkability.<sup>23</sup> Walking is one of the easiest and cheapest ways for residents to become physically active. Thus, by increasing walkability through infrastructure enhancement, municipalities are not only lowering road maintenance costs, reducing traffic, and improving air quality, but they are increasing the level of fitness achieved by their residents and in turn contribute to stroke risk reduction.<sup>23</sup>

### **Possible funding opportunities**

This proposed program in Sussex County could be funded with grants through the National Institutes for Health (e.g. Personalized Strategies to Manage Symptoms of Chronic Illness, Self-Management for Health in Chronic Conditions, or Population Health Interventions: Integrating Individual and Group Level Evidence), as well as through partnership with community resources such as senior centers, Sussex County Health Coalition, and the Diabetes and Heart Disease Prevention and Control Program. Partnership with local organizations would strengthen the health plan by providing patients with a multitude of supportive and health promoting services as well as several locations and knowledgeable staff to assist with the 12 week education program.

### **Conclusion**

High rates of stroke deaths in Sussex County, DE suggest there are unmet needs spanning the individual, community, and policy levels, particularly among rural-dwelling older adults with restricted health care access, comorbid health conditions, and poor health behaviors associated with CVA's. As a result, this health plan focuses on healthy nutrition and increased physical activity due to the growing population of obese and overweight older adults in Sussex County as well as the significant impact obesity, poor nutrition, and lack of exercise play in the development and progression of cardiovascular disease and stroke.<sup>2,8</sup> Ultimately the success of

this health plan will be determined by the performance indicator of a deceased stroke rate among seniors in Sussex County to below the U.S. average.<sup>8</sup>

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