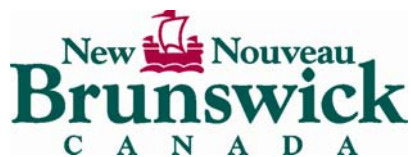


New Brunswick Integrated Stroke Strategy

*Multiple Strategies for Facilitating an Earlier and
Successful Response to Stroke*



**Finding answers. For life.
À la conquête de solutions.**

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Executive Summary

Stroke is largely preventable, stroke is a medical priority, and stroke affects New Brunswickers of all ages. The cost of stroke to New Brunswick is not only measured in terms of healthcare expenditures, it is also measured through the increased demand for services provided by healthcare providers and community agencies; the social and emotional impact on survivors and their families; and through the associated health and lifestyle components that contribute to the risk factors associated with stroke. The New Brunswick Integrated Stroke Strategy addresses five pillars: Wellness, Health Promotion and Stroke Prevention; Emergency and Acute Stroke Care; Rehabilitation Services; Community Reintegration; and Self Management.

Stroke is the fourth leading cause of death in Canada with 16,000 Canadians dying from stroke annually. There are between 40,000 and 50,000 strokes a year in Canada with about 300,000 Canadians living with the effects of stroke. After the age of 55 the risk of stroke doubles every ten years and a stroke survivor has a 20% chance of having another stroke within two years. The effects of stroke vary from survivor to survivor. Of every 100 people that have a stroke, 15% will die, 10% recover completely, 25% recover with minor impairment or disability, 40% are left with a moderate to severe impairment, and 10% are so severely disabled that they require long term care. (Heart and Stroke Foundation of Canada)

Stroke financially costs the Canadian economy \$2.7 billion a year. The average acute care cost is about \$27,500 per stroke with Canadians spending a total of 3 million days in hospital because of stroke. (Heart and Stroke Foundation of Canada)

In 2004-2005 there were 1,103 discharges from New Brunswick hospitals for which the most responsible diagnosis was stroke. This number does not represent strokes that occur in hospital with another primary diagnosis, strokes that occur with no admission to hospital, and potentially the number of “mini-strokes” that occur with or without subsequent health care intervention. Stroke remains one of the most significant responsible diagnoses for hospitalization in New Brunswick.

New Brunswick has some of the highest rates for the risk factors associated with stroke including smoking, obesity, hypertension, and physical inactivity. Specific examples include:

- Over 34,000 people in New Brunswick have been diagnosed with Diabetes, representing 5.4% of the population, with a rate of undiagnosed diabetes estimated to be as high as 30%. (Diabetes Report 2005, Canadian Diabetes Association) The provincial hospital separation rate for stroke in those with diabetes of either gender is roughly seven times higher than in those without diabetes. (Diabetes in New Brunswick:

Prevalence, Incidence, Mortality and Selected Co-Morbidities of Diabetes, 1997/98 to 2001/02)

- 2004 Health Indicators revealed that 52% of New Brunswickers are physically inactive, higher than the Canadian average.
- Obesity rates in adult males and females in New Brunswick are 31% and 28% respectively, well above the national rate of 22.9 and 23.2% Canadian Community Health Survey (CCHS), 2004
- Smoking rates continue to be higher than the national average, 24% of the population in 2004. Canadian Tobacco Use Monitoring Survey (CTUMS)

In the year 2000 the percentage of seniors in New Brunswick was 12.9%. With an increasingly aging population in New Brunswick, in 2021 the over 65 population is expected to be 22.2% of the population (Statistics Canada). The risk and frequency of stroke will increase due to this increasingly larger segment of the population. As well, if there are not changes in the previously highlighted risk factors associated with stroke, the demands on the healthcare system will be substantial and the impact on families, regardless of their rural or urban settings, will be life altering.

New Brunswick has started to take action to address some of these issues, specifically through the Wellness Strategy and the Provincial Health Plan, Healthy Futures. The components and target areas provided in the Provincial Health Plan, Healthy Futures, form the starting point to address the issues and care needs related to stroke. However, further stroke specific recommendations and actions are required to significantly reduce the frequency of stroke, respond in a more timely and effective manner to stroke, and to ensure that stroke survivors reach their full potential following a stroke.

The process to develop an Integrated Stroke Strategy for New Brunswick was led by the New Brunswick Integrated Stroke Advisory Committee (NBISSAC) through a consultative process with healthcare providers, community agencies, and stroke survivors. The recommendations contained within each section of this document reflect the discussion and consensus of the NBISSAC. These recommendations are based on the abundant evidence across Canada and internationally with respect to best practices, evidence based protocols, and client centred service delivery and were adapted to the New Brunswick context. Further research in stroke assessment, treatment, and services will require the New Brunswick Stroke Strategy to be appraised on a regular basis to ensure that it remains relevant for practitioners and the stroke survivors receiving services.

Summary of Recommendations

Wellness, Health Promotion, and Stroke Prevention

1. Make high blood pressure prevention and control a priority via:

- Developing a multistakeholder group to formulate and develop linked strategies to deal with high blood pressure
- Increasing accessibility to and update of blood pressure monitoring in venues where the population gather on a frequent basis
- Providing ongoing education to health service providers on clinical guidelines for high blood pressure prevention and control
- Implementing a public awareness campaign on the risk factors associated with stroke, specifically hypertension

2. Promote physical activity for all ages in the population via:

- Building and sustaining Healthy Eating Physical Activity Coalition of New Brunswick (HEPAC) Activities
- Supporting implementation of Education policies which mandate physical education standards provincially
- Supporting and building community capacity to improve physical activity
- Identification of opportunities, incentives, and community partnerships to encourage physical activity participation through the use community public and private venues

3. Promote healthy eating for all ages in the population via:

- Building and sustaining HEPAC Activities
- Supporting implementation of healthy school nutrition policy (Policy 711)
- Supporting and building community capacity to implement healthy nutrition policies and practices

4. Work towards a smoke-free New Brunswick by building and sustaining activities of the Anti Tobacco Coalition via:

- Promoting tobacco free school initiatives
- Endorsing smoke free private environments
- Endorsing smoke free Regional Health Authority (RHA) properties
- Supporting cessation opportunities via:
 - Extended and institutionalized clinical tobacco intervention program in various settings and amongst all providers
 - Promote the use of fax back service to Smoker's Helpline
 - Support availability of a range of smoking cessation services in primary care settings

5. Engage in prevention activities directly related to risk factors associated with stroke via:

- Establishment of RHA vascular clinics in the form of urgent referral clinics with diagnostics to determine cause of Transient Ischemic Attack (TIA) and provide rapid access to vascular intervention (i.e. carotid endarterectomy, stenting, etc.)
- Secondary prevention referral clinics to identify and follow-up on cardiovascular or neurovascular risk factors identified through the urgent referral clinic
- Support and/or establishment of services and programs for cholesterol screening
- Develop and implement as part of existing programs (Early Childhood Initiatives (ECI), Addiction Services, Healthy Learners) comprehensive actions to reduce excessive alcohol consumption and binge drinking.
- Supporting and promoting activities around identification and management of diabetes
- Supporting current activities around risk awareness, harm reduction, and avoidance of illegal drug use as it relates to stroke
- Establishment of provincial process/standards to ensure high risk patients have timely access to secondary prevention services
- Provision of education/training in the area of prevention for all health care providers, the general population, and within the education/university curriculum
- Establishment of indicators for measuring performance

Emergency and Acute Stroke Care

1. Increased recognition of stroke as a medical emergency via:

- Increased public awareness and education around stroke symptoms and urgency for immediate treatment
- Training and education for Emergency Medical Services (EMS) staff to increase recognition of stroke
- Recognition that early diagnosis and treatment may have a profound positive impact for patient potential recovery

2. Establish EMS protocols for the emergency treatment and transportation of stroke patients to medical facilities via:

- Development of symptom identification and management protocols for EMS personnel
- Emergency destination policies to direct personnel transporting individuals suspected of having a stroke to the nearest facility with a CT Scanner
- Hospitals receiving suspected stroke patients will develop stroke triage strategies

3. t-PA should be a consideration for patient treatment via:

- Following best practice for the administration of t-PA medication
- Access to neurology for t-PA administration, potentially via telehealth modalities

4. Development of comprehensive standard admission protocols as it relates to stroke with consideration to:

- Assessment of blood pressure
- Assessment of blood sugar
- Screening for swallowing ability/aspiration
- Consideration of deep vein thrombosis (DVT)
- Consideration for nutrition
- Consideration for hydration
- Use of appropriate diagnostic assessment measures which follow best practices

5. Regional collaboration in order to establish a process to develop appropriate stroke care via:

- Ongoing regional collaboration and networking
- Development of a regional implementation plan following the completion of the New Brunswick Integrated Stroke Strategy
- Professional development opportunities and forums for professional sharing of expertise and service delivery strategies

6. Acute stroke units/beds should be established based on the expertise available and the critical mass of patients via:

- Commitment of each Regional Health Authority to acute stroke units/beds through their strategic planning activities
- Defined space and location within the regional hospital for acute care stroke patients
- Development of regional inter-disciplinary stroke/resource teams
- Identification of areas and professionals where further training in the area would be beneficial in enhancing stroke care services within the region
- Development of regional implementation strategies with timelines to meet the goals of the New Brunswick Integrated Stroke Strategy

7. Current centres with stroke expertise, as well as regions enhancing stroke services, will develop linkages to enhance services and knowledge via:

- The use of technology to interface with resources when required in order to increase local response to stroke patient needs and share expertise, e.g. video conferencing, telehealth, etc.
- Identification of leaders and resources in stroke throughout the NB system
- Inter-regional collaborative stroke teams and linkages which meet the varied local needs across regions

8. Medical treatment of acute stroke should be based on current evidence; with consideration for the facility resources and expertise via:

- Use of Canadian standards of preferred and best practice for stroke care and delivery of services
- Development of regional and inter-regional protocols and strategies
- Use of Quality of Care Study Identification of Performance Indicators for Acute Stroke (CMAJ, January 2005)

Rehabilitation Services

1. Increased recognition of stroke as a priority for rehabilitation assessment and treatment via:

- Establishment of a RHA interdisciplinary stroke teams (advisory and direct service) whose members which consist of appropriate levels of medical, nursing, physiotherapy, occupational therapy, speech language pathology, social work, psychology, dietitian, and ancillary services as required and representation from providers across regional services
- Development of regional rehabilitation service pathways
- Access to necessary equipment for rehabilitation assessment and treatment

2. Patients admitted to hospital due to stroke should be treated by interdisciplinary teams via:

- Use of consistent assessment tools and terminology to ensure communication across professionals, facilities, regions, and the continuum of care
- Consistent assessment of core areas identified based on current literature, e.g. dysphagia, cognition, mobility, ADLS, visual/perceptual, etc.
- Coordination of care which is client centred and directed
- Patient and caregiver education and counseling with lifestyle interventions as a core component

- Interregional collaboration in order to access tertiary and specialised centres of expertise across the province with the use of telehealth when appropriate
- Effective information dissemination between professionals
- Client centred discharge planning to ensure continuity of care and service delivery post discharge

3. Patients discharged from hospital requiring rehabilitation services should receive services via:

- Out-patient and community based services which are integrated, coordinated, timely, accessible, and follow an interdisciplinary approach
- Appropriate levels of therapy intensity and frequency which are reflective of changing patient needs and goals
- Consideration for community reintegration
- Services provided adhering to best and preferred practices

4. Patient centred rehabilitation should be guided via:

- Specific and realistic goals developed in conjunction with the patient, family, significant others and rehabilitation team
- Formal and regular interdisciplinary meetings
- Effective information dissemination across regional service providers and to the patient
- Active involvement of family and informal supports early on in the rehabilitation process
- Team support to patients for securing necessary funding for recommended equipment
- Patient and informal support awareness of resources and services in the community

5. Stroke Interdisciplinary Teams should be supported via:

- Opportunities for the development of clinical leadership by all members of the Team
- Knowledge transfer between Team members should occur regularly
- Identification of clinical leaders in various aspects and treatment areas associated with stroke rehabilitation should be identified for purposes of professional consultation, professional development potential, and local capacity building
- Regular and ongoing communication/collaboration across the continuum of care
- Training and professional development for staff for participation on the regional team

6. Rehabilitation assessment and treatment of stroke should be based on current evidence via:

- Use of New Brunswick and Canadian standards of preferred and best practice for stroke care and delivery of services
- Development of regional and inter-regional protocols and strategies
- Consideration of standards such as the Stroke Canada Optimization of Rehabilitation through Evidence (SCORE) Project

Community Reintegration

1. Increased recognition of stroke survivor needs in the community via:

- Care pathways that reflect community reintegration needs on a long term basis
- Effective and client centred pre discharge needs assessment with planned follow-up
- Education and training for health providers around topics related to community reintegration
- Collaboration with community based services
- Vocational counseling and training

2. Empowerment of stroke survivors via:

- Self management support programs
- Awareness of community services available post discharge
- Opportunities to volunteer and provide peer support for other stroke survivors

3. Collaboration and communication between government services and community based service providers via:

- Participation of community service providers on regional stroke planning committees
- Development of integrated and coordinated regional service delivery models
- Development of ongoing communication pathways between service providers
- Provincial government support of volunteer opportunities through liability protection legislation and waiving the fee required for criminal record checks

Self Management

1. Self management support should be viewed globally, across patient medical conditions and health issues via:

- Coordination of programs
- Generic self management support programs
- Empowerment of the client to participate in self management activities

2. Self management support should be incorporated as part of the philosophy of care via:

- Regional Health Authority delivery statements
- Professional practice
- Client communication and interactions

3. Self management should be a component of awareness for professionals and public alike via:

- Education and professional development
- Public awareness activities

Wellness, Health Promotion, and Stroke Prevention

Stroke is largely preventable through health education, healthy lifestyle choices, and informed decision making. However, there are instances where stroke is not related to prevention as is the case with blood disorders and in certain diseases where there is higher risk of stroke. Even with hypothetical 100% prevention activities, there will still remain strokes that require assessment and intervention. The first step in addressing stroke is to promote population based wellness, health promotion, and prevention activities specific to stroke.

Wellness

In January 2006 the government of New Brunswick announced its Wellness Strategy. "The 2004-2008 Provincial Health Plan, *Healthy Futures: Securing New Brunswick's Health Care System* established four strategic priorities to guide new investments and actions to ensure the sustainability of New Brunswick's health care system today and into the future. The Government of New Brunswick established as its first priority *Improving Population Health* because it recognizes that healthy living is basic to good health and personal well-being. Within this strategic priority are measures to promote healthy living, to better manage and control chronic diseases, to reduce the incidence of cancer and to prevent sickness and disease through an expanded immunization program."

There are ***five strategic directions*** contained within the Wellness Strategy. Strategic direction one focuses on ***partnership and collaboration*** through activities with:

- the Healthy Eating Physical Activity Coalition of New Brunswick (HEPAC),
- the New Brunswick Anti-Tobacco Coalition (NBATC), and
- the New Brunswick Advisory Council on Youth.

Strategic direction two supports ***community development*** through activities such as the:

- Link Program / Programme Le Maillon,
- "5 – 10 a day – It's the Healthy Way",
- the Active Communities Grant Program,
- the Tobacco Free Schools Grant Program, and
- the Baby-Friendly™ Initiative.

Strategic direction three aims to ***promote healthy lifestyles through a social marketing campaign and learning opportunities***.

The fourth strategic direction looks at research evaluation, and surveillance. This will be accomplished through the:

- Wellness Surveillance Program,
- Physical Activity Monitoring Initiative,
- NB Nutritious Food Basket Initiative, and the
- UNB Paediatric Weight Management Clinic.

The fifth strategic direction looks at healthy public policy. “Since June 1999, the Government of New Brunswick has developed and implemented a number of public policy initiatives and programs that promote wellness and healthy living. These include:

- **Smoke-free Places Act**, which prohibits smoking on school grounds, in retail stores, community halls, conference centres, sports arenas, bingo, bars, restaurants and all indoor workplaces.
- **Healthier Foods and Nutrition in Public Schools**, a comprehensive nutrition related policy to provide students with healthy food and beverage choices in schools.
- **Succès NB Success**, an online tool to help individuals and groups increase physical activity and literacy.
- **School Communities in ACTION**, a program designed to assist schools in adopting, implementing and maintaining a variety of physical activity opportunities.
- **GO NB!**, a grant program that provides funding to support partnerships among sport and recreation organizations, schools and communities.
- **Healthy Minds**, a grant program for Kindergarten to Grade 3 schools to ensure hunger is not a barrier to learning.
- **Healthy Learners in School Program**, a program in which Public Health nurses work with schools and parents to develop and support health promotion efforts that involve all areas of health — physical, emotional and social – and support healthy decision-making and behaviours that will last into adulthood.”

The initiatives associated with the Wellness Strategy cross the age spectrum and are aimed at reducing the incidence of chronic disease in New Brunswick. The Wellness Strategy will address many areas of healthy living that have been demonstrated to reduce the incidence of stroke. The government also announced the creation of the Department of Wellness, Culture, and Sport in February 2006.

Health Promotion

In order to understand the definition of health promotion, it is important to know the meaning of 'health'. The World Health Organization (WHO) defines health as a "complete state of physical, mental and social well-being, not just the absence of disease." Health promotion is the process of enabling people to increase control over and improve their health. Health promotion aims to improve or protect health through behavioural, biological, socio-economical and

environmental changes. “Health promotion is a planned and managed process of encouraging and assisting improvement in the health of a population as distinct from the provision of health care services.” (WHO, 1998) Health promotion is most often associated with system initiatives and programs for individuals. Wellness incorporates the goals of health promotion at the personal level.

Examples of health promotion in New Brunswick include many of the initiatives identified in the Wellness Strategy as well as:

- activities of the New Brunswick Heart and Stroke Foundation such as “Health Check”, “Small Changes, Big Rewards”, and “Workplace Wellness”;
- additional government initiatives such as the Early Childhood Initiatives (ECI) and Active Living promotion; and
- local community activities such as individual school nutrition policies, fitness activities, and others.

Stroke Prevention

Ideally it is optimal for the individual to prevent a possible stroke through healthy lifestyle choices and effective medical management of contributing conditions. However, once an individual has experienced a stroke, further prevention is warranted as there is a risk for a subsequent stroke.

Primary stroke prevention involves modification of risk factors before symptoms or illnesses occur at the individual or population level. Primary prevention at the individual clinical level is often implemented in the primary care setting with often the individual’s family physician providing education and advice. At the population level, this may include general education and support to bring about behaviour changes linked to healthier lifestyles such as smoking cessation, weight loss, and chronic disease management topics such as diabetes, hypertension, etc.

Secondary prevention is an individually based clinical approach to reducing the risk of recurrent events in individuals who have already experienced an event, and in those who are experiencing symptoms that place them at high risk of an event. For example, there is a 30% chance that an individual who experiences a Transient Ischemic Attack (TIA) which does not impact long term function will have a stroke within five years.

Prevention activities recognise an individual’s uncontrollable and controllable risk factors.

Uncontrollable risk factors, which cannot be changed, related to stroke include:

Family History

If a parent or a sibling had a stroke before the age of 65, then there is a 70% increased risk of stroke for other members of the family. Other familial risk factors include coronary disease, history of diabetes, and high blood pressure/hypertension.

Gender

Men have a greater risk of having a stroke than women. However, since women tend to live longer than men, more women die of stroke due to increased aging.

Ethnicity

First Nations, African, and South Asian descent tend to have higher incidence of high blood pressure and diabetes. These individuals have a higher risk for stroke compared to the general population

Age

The risk of stroke and TIA increases with age. Although strokes can occur at any age, two thirds of all strokes occur in people over the age of 65. Increased age is the dominant risk condition for heart disease and stroke. Rates of all major forms of heart disease increase with advancing age and for women the risk of stroke increases significantly following menopause. As the Canadian population ages, the number of individuals with heart disease and stroke is expected to increase.

Prior Stroke or TIA

It is reported that up to one third of individuals who survive a stroke or transient ischemic attack (TIA) have another stroke within five years. A TIA is a serious warning sign of an increased risk of stroke. The risk of stroke for individuals with TIA is 5% within 48 hours, 8% within 1 month, 12% within 1 year and up to 30% within 5 years.

Controllable Risk Factors which can change or be controlled by modifying lifestyle or through the use of medication include:

High Blood Pressure/Hypertension

Hypertension is identified as the number one risk factor associated with stroke. Research evidence strongly supports the benefits of treating high blood pressure to reduce the incidence of stroke. On average, for every 7.5mmHg reduction in diastolic pressure, there may be a significant reduction in the risk of stroke. In Canada, 22% have hypertension and of these 22%, 42% are unaware they have hypertension. According to the 2003 Canadian Community Health Survey, 16.2% of New Brunswickers are hypertensive. Approximately 15-20% of all hypertension is treated effectively in Canada and can reduce the number of strokes by 35-40 %.

Diabetes

Diabetes Mellitus is a condition in which the body doesn't produce or properly use insulin. Diabetes often leads to high blood pressure and high levels of cholesterol in the blood. Diabetics have 1.5-2.5 greater risk for ischemic stroke. Diabetes is also strongly correlated with high blood pressure, high cholesterol and being overweight. According to the Canadian Community Health Survey (2003) New Brunswick has the third highest rate of diabetes in the country.

Cholesterol

"LDL (low-density lipoprotein) cholesterol is often called 'bad' cholesterol. It doesn't really deserve this name - our bodies need normal amounts of LDL cholesterol for cell growth and repair. However, high levels of LDL cholesterol in the blood can cause a buildup of plaque (fatty deposits) inside your blood vessels, leading to atherosclerosis (narrowing of the arteries)." (Heart and Stroke Canada) High cholesterol can double the risk of ischemic stroke. It is estimated that that over 45% of the population of Canada have an LDL cholesterol reading which exceeds the desirable level.

"HDL (high-density lipoprotein) cholesterol is often called 'good' cholesterol. It helps to carry LDL cholesterol away from blood vessel walls. Current research indicates that HDL cholesterol may help protect us from atherosclerosis and heart disease, so higher levels are considered good." (Heart and Stroke Canada)

Physical Inactivity

Strong evidence supports the benefits of physical activity in reducing the risk of coronary heart disease, hypertension, diabetes mellitus and obesity. New Brunswick has the second highest rate of physical inactivity in females with 61% of the population being inactive, while New Brunswick males rank third in the country at 49%.

Obesity

Obesity rates (BMI greater than or equal to 30) for males in New Brunswick are 31% compared to 28% for women. This rate is higher than the national average for Canada for both sexes. Among children the overweight/obesity rate is 34% compared to 26% nationally. (CCHS 2.2, 2004, Statistics Canada). The rates for obesity in both adults and children continue to steadily climb. In addition to high adult rates, New Brunswick was identified as having the second highest rate of childhood overweight/obesity in Canada. Obesity is now recognized by experts as the second-leading preventable cause of death after cigarette smoking. It is estimated that 750 New Brunswick residents die prematurely each year due to obesity-related illness. Obesity-related illnesses cost the New Brunswick health care system an estimated \$96 million dollars annually.

Smoking

In March 2005, the Canadian Tobacco Use Monitoring Survey results were released indicating that New Brunswick has the highest percentage of smokers in the country. New Brunswick's smoking rate is currently 24%. For both women and men the highest percentages of smokers are between the ages of 20-24. It is estimated that 1,300 New Brunswickers lose their lives every year due to smoking. Smoking costs the province of New Brunswickers an estimated \$120 million annually in medical care costs. There also appears to be an increased risk associated with smoking and oral contraceptive use in women.

Excessive Alcohol Consumption/Binge Drinking

Drinking too much alcohol (2 drinks or more a day, exceeding a weekly limit of 14 for men and 9 for women) increases your risk for stroke. Excessive drinking increases the risk of a hemorrhagic stroke by a factor of three to four, and can double the risk of ischemic stroke. According to the 2003 Canadian Community Health Survey, New Brunswick has the second highest rate (28%) of heavy alcohol consumption (five drinks in a single sitting, 12 or more times per month), when compared to the rest of the Canada.

Atrial Fibrillation

Atrial fibrillation is a type of irregular heart rhythm, which leads to an increase risk of blood clots which can dislodge and travel to the brain. Individuals with atrial fibrillation have a 3-5% times greater risk of having a stroke.

Coronary Heart Disease

Having coronary heart disease (also known as ischemic heart disease) doubles the risk of ischemic stroke. People with coronary heart disease have hardening of the arteries (atherosclerosis), which may affect the arteries to the brain. They are also at greater risk of developing blood clots (that can catch in the arteries to the brain and interrupt blood flow).

Illicit or "Street" Drugs

Both ischemic and hemorrhagic stroke have occurred as the result of drug abuse. (Heart and Stroke Canada) Recreational drug use can increase blood pressure, cause blood vessels to narrow, may create an extreme immune response over time which, with time, stresses the blood vessels, and particles used in drug processing may be injected into the bloodstream.

Recommendations for Wellness, Health Promotion, and Stroke Prevention

1. Make high blood pressure prevention and control a priority via:

- Developing a multistakeholder group to formulate and develop linked strategies to deal with high blood pressure
- Increasing accessibility to and update of blood pressure monitoring in venues where the population gather on a frequent basis

- Providing ongoing education to health service providers on clinical guidelines for high blood pressure prevention and control
- Implementing a public awareness campaign on the risk factors associated with stroke, specifically hypertension

2. Promote physical activity for all ages in the population via:

- Building and sustaining Healthy Eating Physical Activity Coalition of New Brunswick (HEPAC Activities)
- Supporting implementation of Education policies which mandate physical education standards provincially
- Supporting and building community capacity to improve physical activity
- Identification of opportunities, incentives, and community partnerships to encourage physical activity participation through the use community public and private venues

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4. Work towards a smoke-free New Brunswick by building and sustaining activities of the Anti Tobacco Coalition via:

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- Endorsing smoke free Regional Health Authority (RHA) properties
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 - Support availability of a range of smoking cessation services in primary care settings

5. Engage in prevention activities directly related to risk factors associated with stroke via:

- Establishment of RHA vascular clinics in the form of urgent referral clinics with diagnostics to determine cause of Transient Ischemic Attack (TIA) and provide rapid access to vascular intervention (i.e. carotid endarterectomy, stenting, etc.)
- Secondary prevention referral clinics to identify and follow-up on cardiovascular or neurovascular risk factors identified through the urgent referral clinic
- Support and/or establishment of services and programs for cholesterol screening

- Develop and implement as part of existing programs (Early Childhood Initiatives (ECI), Addiction Services, Healthy Learners) comprehensive actions to reduce excessive alcohol consumption and binge drinking.
- Supporting and promoting activities around identification and management of diabetes
- Supporting current activities around risk awareness, harm reduction, and avoidance of illegal drug use as it relates to stroke
- Establishment of provincial process/standards to ensure high risk patients have timely access to secondary prevention services
- Provision of education/training in the area of prevention for all health care providers, the general population, and within the education/university curriculum
- Establishment of indicators for measuring performance with consideration to wait times for referral, assessment, treatment, and provision of patient self management education

Emergency and Acute Stroke Care

The increased awareness to a more responsive approach to acute stroke care and management leads to an approach that treats stroke as a “true medical emergency”. Past perspectives regarding stroke which led to a public perception that it is “a tragedy that can't be helped” have significantly evolved into recognising the value of responsive medical assessment and treatment for enabling increased patient outcomes. Since stroke is defined as a sudden loss of brain function caused by the interruption of the flow of blood to the brain,⁽²¹⁾ the length of time the brain is without blood flow greatly impacts the amount of permanent brain damage. Early diagnosis and treatment makes the difference between a stroke patient surviving a stroke with minimal disabilities to living the remainder of life with decreased independence which has implications on family; informal support; services required/provided across the social-health services spectrum; and most importantly quality of life. There are various issues underlying acute stroke therapy including lack of public awareness and education, education for health professionals who routinely provide service to stroke patients, lengthy response times for identifying and treating stroke, late presentation of the patient for services to assist in stroke treatment and rehabilitation, and the need for the development of emergency triage and pathways in hospitals. In the 2003/04 Annual Report of Hospital Services, under the case mix group of “specific cerebrovascular disorders except TIA”, there were 1,153 cases with a total length of stay for all patients of 16,774 days. This translates into an average length of stay of 14.5 days per patient under this case mix group. In the final analysis “time is brain” and the equation to successfully meet the needs of New Brunswickers experiencing a stroke involves a mix of patient transportation, responsive service delivery, appropriate treatment, education, and public awareness.

Current Practice in New Brunswick

Access to coordinated systematic stroke care varies from region to region across the province. At present there are:

- Regional facilities to address medical needs present in all Regional Health Authorities (RHAs).
- CT Scanners available in all RHAs with 24/7 access.
- Stroke units have been developed in some regional hospitals (RHAs 1SE, 2, and 3).
- Some facilities have care maps/protocols to guide the acute phase of stroke care.
- Ambulance Services transport patients to the nearest emergency department.

Best Practices in Emergency & Acute Stroke Care

Over the past few years, stroke has moved into the spotlight of healthcare bringing with it research and professional collaboration on how to best coordinate the care for those who have experienced a stroke. This research has provided evidence based protocols and recommendations to assist healthcare professionals to identify and implement optimal stroke care. Best practice addresses topics related to patient transportation, thrombolytic therapy (t-PA), computerized tomography (CT) scan, telehealth, acute care stroke units/designated beds, care coordination, acute care protocols/care maps, and emergency triage.

Emergency Ambulance Services

Patient transportation in stroke management is a critical component to initial diagnosis and timely access to required treatment. Ambulance services are frequently the first health professionals to encounter a patient experiencing a stroke and respond to this condition as a time-dependent medical emergency. Symptom identification, implying increased public awareness and knowledge, a 911 call, and possibly contact with Tele-care are the first steps towards providing treatment. These first steps may optimize the chance of full or partial recovery for the patient. In response to a 911 call ambulance services will likely be dispatched. Emergency responders, as first response professionals, require training for on-site stroke identification and management. Initial response also includes patient transportation to a medical facility which has the professional expertise, equipment, and designated beds to meet the needs of a stroke patient.

Key Components: Responsive, Public Awareness, 911, Service Provider Training, Transportation to the Centre that Best Meets the Patient's Needs

Thrombolytic therapy (t-PA)

The introduction of thrombolytic therapy has revolutionised the management of acute ischemic stroke, 80% of all known strokes are considered ischemic. Thrombolytic drugs are "clot busters" – drugs that break up blood clots. If given to the appropriate ischemic stroke patient within three hours of the onset of the stroke the medication can restore blood flow in the brain thereby reducing and preventing the risk of permanent damage. Some patients who receive t-PA have a complete reversal of symptoms such as weakness on one side or the inability to speak. There are several important limitations to the use of t-PA in the treatment of stroke.

- It must be administered within 3 hours of the onset of the stroke.
- It can only be given to someone who has had an ischemic stroke
- To ensure it is not accidentally given to someone who is having a hemorrhagic stroke, a CT scan and other tests (e.g. blood tests) must be done before t-PA can be administered.

A two-year study, *Canadian Alteplase for Stroke Effectiveness Study (CASES)*, was conducted to assess the safety and effectiveness of clot-busting drugs (t-PA) as a routine treatment for acute stroke. Findings of this study concluded that 37% of people treated with t-PA had an excellent clinical outcome suggesting that widespread use of t-PA for severe stroke will save lives and help many people return to a completely normal life following stroke. Additionally, there were no differences in the rates of positive outcomes or intracranial hemorrhage between the high-volume hospitals and community hospitals. This study also confirms that t-PA is more beneficial and has fewer side effects than previous studies have shown. Treatment with t-PA, when appropriate (less than 9% of stroke victims meet the inclusion criteria), improves outcomes from stroke by 50 per cent. Although t-PA is expensive, cost-effectiveness analysis of the results of the NINDS t-PA trial indicated substantial long-term savings because fewer patients receiving t-PA require chronic care and other associated health and social services. At present, a number of patients who might benefit from this treatment do not meet the treatment window of 3 hours.

Key Components: Early Diagnosis, Access to CT Scan Equipment, Lab Services, Timely Treatment

Computerized Tomography (CT) Scan

A CT scan is recommended for all stroke patients to determine whether the stroke is ischemic or hemorrhagic as this assists the physician in determining appropriate treatment. Strong level 1 evidence supports the use of non contrast CT scan of the head for the initial evaluation of a patient with suspected stroke, as it either confirms or excludes intracerebral or subarachnoid hemorrhage. In the event that the stroke is determined to be an ischemic stroke and the individual is a candidate for t-PA this may be administered within the three hour window of opportunity. Access to both the CT scan and a professional with the expertise (on-site or through technology linkages) to interpret results requires 24/7 availability.

Key Components: Tool for Early Diagnosis of Ischemic Stroke, Access to Professional for Interpretation of Results 24/7

Telehealth

Telehealth for stroke uses state-of-the-art video telecommunications that present as a potential resource for smaller communities, increase access to information dissemination and testing interpretation, and ensure timely and responsive service delivery to stroke patients regardless of where they live in New Brunswick. Telestroke could facilitate remote cerebrovascular specialty consults from virtually any location, adding greater access to expertise for the care of any individual patient. Telehealth has potential to increase the use of tissue plasminogen activator (t-PA) for ischemic stroke as timely diagnosis is the critical factor to receive appropriate treatment.

Telehealth is one component to provide stroke expertise to remote and underserved areas, however, it is not the panacea to provide all stroke services within a region.

Key Components: Access to Telecommunications Equipment, Identified Centres and Professionals with Cerebrovascular Expertise

Dysphagia

The incidence of dysphagia in the acute phase of stroke varies between one-third and two-thirds of all stroke patients affected. Between one-third and one-half of patients who aspirate following stroke are silent aspirators. With the increased risk of developing pneumonia due to aspiration consensus in the literature indicates that a trained assessor should screen all stroke survivors when they are able to be screened, typically within 48 hours of admission. Until that point they should be nil per oral (NPO). (Evidence-Based Review of Stroke Rehabilitation, 7th Edition)

Key Components: Timely and Responsive Initial Screening, Access to Dysphagia Team, Access to Videoflouroscopy Equipment

Acute Care Stroke Units/Designated Beds

The formation of an acute stroke unit is an important step for organizing and delivering care to patients with acute stroke. In smaller regions where the number of patients does not warrant a designated unit, research has demonstrated that dedicated beds are an important factor towards effective delivery of stroke services. Dedicated stroke units/beds differ from general medical wards/beds in their care of patients with stroke as they use interdisciplinary team clinical pathways for diagnosis purposes, treatment modalities, prevention of complications, rehabilitation service delivery, and recognition of family/significant other needs while the patient is in hospital. Interdisciplinary teams of physicians, nurses, rehabilitation therapists, social workers, and other health professionals coordinate care coordination, rehabilitative therapy, and stroke education to assist the patient in reaching maximum abilities prior to discharge. The interdisciplinary team approach also lends itself well to preparing and planning for community reintegration. Current literature suggests that stroke units/beds helps reduce mortality and morbidity, as well as improve patient outcomes. Patients in stroke units have been found to have a shorter length of stay. Case studies have shown that designated areas for stroke care also involves other hospital services such as housekeeping and food services. These support workers have day to day contact with these patients and may provide the Care Team with important perspective and information.

Key Components: Designated Physical Space for Stroke Unit/Beds, Education for all Hospital Services Who Provide Services in the Unit/Beds

Care Coordination

The Quality of Care Study; Identification of Performance Indicators for Acute Stroke Care (Jan 2005, CMAJ) was undertaken in Canada and identifies a set of 23 core indicators for evaluating optimal stroke care. These indicators are a guide for the care that hospitals provide to stroke patients.

Table 1: Core indicators for optimal acute stroke care selected by the expert advisory panel

Patients with acute stroke should be managed on a designated stroke unit
All patients with acute stroke should be evaluated for t-PA eligibility
NINDS inclusion/exclusion criteria should be applied for patient selection for thrombolysis
t-PA best-practice treatment protocol should be followed for t-PA administration
All eligible patients should receive t-PA and within 1 hr of arrival at hospital
Potentially eligible patients should have CT brain scan completed within 25 min of arrival at ED
CT/MRI should be completed within 24 h for patients ineligible for t-PA
CT/MRI should be completed before hospital discharge for patients ineligible for t-PA
Blood glucose level should be checked on arrival at ED and regularly for first 24 hours
Elevated blood glucose level should be treated
Patients should have an electrocardiogram
Fever should be treated with antipyretics
Patients should be mobilized within 24 h
Acute ASA therapy should be initiated as soon as possible
Dysphagia screen should be completed
Indwelling urethral catheter should be avoided
Carotid imaging should be completed during hospital stay or as outpatient post discharge
Patients should be discharged with antithrombotic therapy
Patients with atrial fibrillation should be discharged with warfarin therapy
Patients should be discharged with statin therapy if appropriate
Patients should be discharged with antihypertensive agents if appropriate
Education should be provided for patients and caregivers
Smoking history should be assessed and documented
Note: t-PA = tissue plasminogen activator, NINDS = National Institute of Neurological Diseases and Stroke, ED = emergency department.

Key Components: Familiarity with Core Indicators for Optimal Acute Stroke Care

Acute Care Protocols/Care Maps

The literature suggests that whether or not a designated stroke unit or beds are available, an organized, systematic approach to stroke management (using clinical pathways and algorithms based on best practice) will improve outcomes. The STEP (Stroke Treatment Education Program) is a resource guide to assist facilities in developing clinical pathways and guides. The STEP has been developed by the Canadian Heart and Stroke Society.

Key Components: STEP

Emergency Department Triage

Given the importance of timely and responsive services, patients arriving via ambulance to the emergency department of a designated stroke services facility would require immediate direction to appropriate medical and diagnostic services. Patients who arrive on their own may be at “stroke risk” should they not be aware of their own symptoms as it relates to stroke. Emergency room staff may prevent the impact of stroke by effective triage of potential stroke patients, reducing the wait time for these patients, and develop appropriate resource/professional links to diagnose and treat stroke patients faster.

Key Components: Trained Emergency Room Staff, Reduced Wait Times for Potential Stroke Patients, ER Included as Part of Clinical Pathways for Regional Stroke Services

Recommendations for Emergency and Acute Stroke Care

1. Increased recognition of stroke as a medical emergency via:

- Increased public awareness and education around stroke symptoms and urgency for immediate treatment
- Training and education for Emergency Medical Services (EMS) staff to increase recognition of stroke
- Recognition that early diagnosis and treatment may have a profound positive impact for patient potential recovery

2. Establish EMS protocols for the emergency treatment and transportation of stroke patients to medical facilities via:

- Development of symptom identification and management protocols for EMS personnel
- Emergency destination policies to direct personnel transporting individuals suspected of having a stroke to the nearest facility with a CT Scanner
- Hospitals receiving suspected stroke patients will develop stroke triage strategies

3. t-PA should be a consideration for patient treatment via:

- Following best practice for the administration of t-PA medication
- Access to neurology for t-PA administration, potentially via telehealth modalities

4. Development of comprehensive standard admission protocols as it relates to stroke with consideration to:

- Assessment of blood pressure
- Assessment of blood sugar
- Screening for swallowing ability/aspiration
- Consideration of deep vein thrombosis (DVT)
- Consideration for nutrition
- Consideration for hydration
- Use of appropriate diagnostic assessment measures which follow best practices

5. Regional collaboration in order to establish a process to develop appropriate stroke care via:

- Ongoing regional collaboration and networking
- Development of a regional implementation plan following the completion of the New Brunswick Integrated Stroke Strategy
- Professional development opportunities and forums for professional sharing of expertise and service delivery strategies

6. Acute stroke units/beds should be established based on the expertise available and the critical mass of patients via:

- Commitment of each Regional Health Authority to acute stroke units/beds through their strategic planning activities
- Defined space and location within the regional hospital for acute care stroke patients
- Development of regional inter-disciplinary stroke/resource teams
- Identification of areas and professionals where further training in the area would be beneficial in enhancing stroke care services within the region
- Development of regional implementation strategies with timelines to meet the goals of the New Brunswick Integrated Stroke Strategy

7. Current centres with stroke expertise, as well as regions enhancing stroke services, will develop linkages to enhance services and knowledge via:

- The use of technology to interface with resources when required in order to increase local response to stroke patient needs and share expertise, e.g. video conferencing, telehealth, etc.
- Identification of leaders and resources in stroke throughout the NB system
- Inter-regional collaborative stroke teams and linkages which meet the varied local needs across regions

8. Medical treatment of acute stroke should be based on current evidence; with consideration for the facility resources and expertise via:

- Use of Canadian standards of preferred and best practice for stroke care and delivery of services
- Development of regional and inter-regional protocols and strategies
- Use of Quality of Care Study Identification of Performance Indicators for Acute Stroke (CMAJ, January 2005)

Stroke Rehabilitation Services

The effects of stroke on an individual may include impaired movement, balance and coordination, memory and reasoning, communication, perceptual skills, emotional well being, and swallowing abilities. These effects not only impact the individual activities of daily living but also impact on their ability to participate in household, vocational, and social activities. In order to address these varied and potentially multiple needs of individuals who have experienced a stroke, a team of knowledgeable professionals and supports is required. Evidence demonstrates that most stroke survivors respond well to rehabilitation techniques with a majority returning to community living. The goal of rehabilitation services is to assess, treat, and enable the reintegration of stroke patients back into their community.

Current Practice in New Brunswick

Following a stroke, patients in New Brunswick will likely receive in-patient services while hospitalised. Some health regions have stroke units with organised interdisciplinary teams to meet the needs of stroke patients within their facilities. Community services may be provided in the regions through hospital ambulatory services, day programs, and the Extra-Mural Program. There are also private service providers available for some aspects of stroke rehabilitation.

Informal professional consultation occurs frequently professional to professional both intra and inter-regionally. Formal consultations occur with the Stan Cassidy Centre for Rehabilitation (SCCR) and specialised health professionals on a region by region basis. All regions have rehabilitation staffing across service environments, e.g. physiotherapists, occupational therapists, and speech language pathologists in both hospital and EMP settings. Current service delivery challenges include resource development for stroke rehabilitation with the development of coordinated and integrated services in all health regions and across the province.

Hospital and Community Rehabilitation

Once admitted to hospital patients may follow the care pathway designated at the regional level for receiving stroke services. Rehabilitation occurs as an in-patient and within the community. The treatment goals of each environment may vary as will the intensity and frequency of service provision. In-patient rehabilitation services concentrate on responding to the patient's immediate medical needs, providing therapy as quickly as possible to enable the patient to begin the process of recovery, and preparation of the patient to be discharged home and to community rehabilitation services. Community rehabilitation services; out-patient, day programs, and EMP; aim to continue the process of recovery through continuity of in-patient goals where applicable; service provision in a naturalistic environment; increasing patient self management in their rehabilitation program; and preparation

towards full community reintegration. Residents of long term care facilities may receive rehabilitation services in the facility in which they reside after discharge which is coordinated and supported by nursing home staff. Commonalities between hospital and community rehabilitation include the client centred interdisciplinary nature of service.

Regional Collaboration/Provincial Expertise

There currently exists expertise in stroke services and client centred care in New Brunswick. Some regions have more specialised centres of care and medical service delivery, therefore, coordinated communication between regional stroke rehabilitation teams occurs both formally and informally. Aspects of care coordination will occur between regions as patients may transfer from one facility to another, require specialised testing found in another region, and/or may relocate to another area of the province.

Equipment

Equipment is required for professionals to complete relevant assessments, for patients to participate in rehabilitation programs, and for patients to achieve their potential in recovery. The Extra-Mural Program maintains an equipment loan bank for professionals to access in the course of their work. There are community based agencies that provide equipment, e.g. Easter Seals/March of Dimes, Red Cross, etc. Accessing equipment for long term patient use is facilitated by professionals who are knowledgeable of funding processes and sources necessary to secure recommended equipment.

Best Practices in Stroke Rehabilitation Services

Common elements of comprehensive stroke rehabilitation have been identified by Brandstater and Basmajian 1987 and Roth et al. 1998. These common elements include:

- Commitment to continuity of care from the acute phase of the stroke through long-term follow-up.
- Use of an interdisciplinary team of professionals experienced in and dedicated to the care of the patient with stroke.
- Careful attention to the prevention, recognition, and treatment of comorbid illnesses and intercurrent medical complications.
- Early initiation of goal-directed treatment that takes maximal advantage of the patient's abilities and minimizes disabilities.
- Systematic assessment of the patient's progress during rehabilitation, with adjustment of treatment to maximize benefits.
- Emphasis on patient and family/caregivers education.
- Attention to psychological and social issues affecting both the patient and family/caregiver.

- Early and comprehensive discharge planning aimed at a smooth transition to the community, and at continuity of care to promote social reintegration and resumption of roles in the home, family, recreational, and vocational domains.

Stroke Interdisciplinary Team

Research and best practice demonstrates improved patient outcomes with an interdisciplinary team approach. Core members of the team may include physicians, nursing, physiotherapists, occupational therapists, speech language pathologists, social workers, dietitians, and rehabilitation assistants. Adjunct members may include psychologists, pharmacists, spiritual supports, recreation therapy, and others based on patient needs and treatment goals.

There may be two types of Stroke Teams within the region. One as an advisory role to assist in implementation of stroke strategy recommendations, identify service needs, identify short and long term goals, and evaluate outcome measures associated with stroke services. Another Stroke Team involved in direct patient service will likely focus on services as they are delivered on a daily basis.

Key Components: Regional Stroke Team; Representation Across Service Continuum

Stroke Patient Participation in Rehabilitation

Stroke patients who have an active role in the assessment and identification of their needs following a stroke often demonstrate better progress and increased understanding around secondary prevention. Ensuring patient participation through shared decision making leads to increased compliance with treatment goals, effective transfer of skills into daily routine, and increased self management abilities. Shared decision making is active participation of the patient in the selection of therapeutic goals and treatment options. Patient participation is often viewed in the context of a broader definition of patient where the individual's family and significant others play a key role in stroke recovery.

Key Components: Shared Decision Making, Patient Centered

Core Assessment Areas

Once the patient is medically stable and conditions allow assessment, the patient should be assessed in several core areas of functioning in order to assist the Team in determining patient status, needs, and initial treatment goals. Core assessment areas include areas identified by the International Classification of Functioning, Disability, and Health (ICF), national best practice guidelines, provincial preferred practice documents, and recommendations made by front line service providers in New Brunswick. Stroke patients receive services in many environments and from many professionals. The use of recognized assessment tools, standardised rating scales, and consistent terminology

ensures accurate patient information dissemination between professionals, facilities, regions, and most importantly, to patients themselves.

Core assessment areas should reflect the areas of knowledge and expertise provided by the members of the regional interdisciplinary stroke team. Use of core assessment areas does not prevent the assessment of additional areas as identified by the interdisciplinary team, as a need demonstrated by the patient, and/or an area for assessment requested by the patient.

Key Components: Standardised Assessment Tools, Standardised Rating Scales, Identified Provincial Core Areas of Assessment

Care Coordination

Effective care coordination provided by an interdisciplinary team leads toward enabling the patient to eventually develop self management skills as it relates to their care. Care coordination may be provided by any member of the interdisciplinary team with levels of care coordination varying by team member based on patient needs and objectives. Care coordination should reflect the continuum of care and the philosophy of “wrapping the system around the patient” thereby reducing the need for the patient to navigate a myriad of structures to obtain services.

Strategies for care coordination include:

- regular interdisciplinary team meetings,
- development of care plans with the patient,
- ongoing patient feedback regarding progress and goals,
- ongoing assessment of medical needs,
- ongoing re-evaluation of rehabilitation progress and goals,
- use of telehealth strategies where appropriate,
- empowerment of the client leading to self management strategies,
- secondary prevention,
- involvement of community agencies, and
- preparation for community reintegration.

Care coordination should lend itself to timely patient centred service delivery, appropriate levels of service delivery, access to required professionals across patient settings, and support service provision within the guidelines of best and preferred practice. Outcomes of effective care coordination will be observed through successful secondary prevention activities and patient self management.

A key component of care coordination includes intensity of service provision. Intensity of service matches the patient’s needs while following best and preferred practices of service delivery.

Key Components: Interdisciplinary Care Coordination

Lifestyle Interventions

“... rehabilitation provides the opportunity to coach and encourage positive lifestyle behaviours and increases compliance with medication use. For personal behaviour change, several key elements need to be present:

- A belief that change is possible.
- Motivation to make the change.
- A support network and personal capacity to enact and sustain change.

The rehabilitation program provides the opportunity to coach and encourage the person to more positive lifestyle behaviours and sustained healthy habits. Enabling a person in cardiac rehabilitation to change what will be ingrained lifestyle behaviours may be a difficult yet rewarding experience. Many of the lifestyle behaviours will have been developed over years and will be reinforced by the social and community settings in which the person lives.”
(Evidence-Based Best Practice Guideline, Cardiac Rehabilitation, New Zealand, 2002)

Lifestyle interventions include areas such as physical activity, nutrition management, weight management, smoking, and psychosocial issues. Life style interventions assist in leading to patient self-management of health.

Key Components: Patient Education Programs, Capacity of Community Based Resources, Self-Management

Continuity of Care

There are three areas of continuity of care (Haggerty, Reid, Freeman, Starfield, Adair, and McKendry. Continuity of Care: A Multidisciplinary Review, *BMJ*, 2003; 327-1219-1221.) with two core elements. The first core element is care of the individual patient where continuity is how individual patients experience integration of services and coordination. The second core element is care over time. Three types of continuity are highlighted which vary according to the providers and context of care.

Informational continuity—Information is the common thread linking care from one provider to another and from one healthcare event to another. Documented information tends to focus on the medical condition, but knowledge about the patient's preferences, values, and context is equally important for bridging separate care events and ensuring that services are responsive to needs.

Management continuity is especially important in chronic or complex clinical diseases that require management from several providers who could potentially work at cross purposes. Continuity is achieved when services are delivered in a complementary and timely manner. Shared management plans or care protocols facilitate management continuity, providing a sense of predictability and security in future care for both patients and providers. Flexibility in adapting care to changes in an individual's needs and circumstances is an important aspect of management continuity.

Relational continuity bridges not only past to current care but also provides a link to future care. Even in contexts where there is little expectation of establishing ongoing relationships with multiple care givers, such as inpatient and nursing home care services, a consistent core of staff provides patients with a sense of predictability and coherence.

Key Components: Responsive and Accessible Services, Communication Pathways, Adaptable Service Delivery

Recommendations for Rehabilitation Services

1. Increased recognition of stroke as a priority for rehabilitation assessment and treatment via:

- Establishment of a RHA interdisciplinary stroke teams (advisory and direct service) whose members which consist of appropriate levels of medical, nursing, physiotherapy, occupational therapy, speech language pathology, social work, psychology, dietitian, and ancillary services as required and representation from providers across regional services
- Development of regional rehabilitation service pathways
- Access to necessary equipment for rehabilitation assessment and treatment

2. Patients admitted to hospital due to stroke should be treated by interdisciplinary teams via:

- Use of consistent assessment tools and terminology to ensure communication across professionals, facilities, regions, and the continuum of care
- Consistent assessment of core areas identified based on current literature, e.g. dysphagia, cognition, mobility, ADLS, visual/perceptual, etc.
- Coordination of care which is client centred and directed
- Patient and caregiver education and counseling with lifestyle interventions as a core component
- Interregional collaboration in order to access tertiary and specialised centres of expertise across the province with the use of telehealth when appropriate
- Effective information dissemination between professionals
- Client centred discharge planning to ensure continuity of care and service delivery post discharge

3. Patients discharged from hospital requiring rehabilitation services should receive services via:

- Out-patient and community based services which are integrated, coordinated, timely, accessible, and follow an interdisciplinary approach
- Appropriate levels of therapy intensity and frequency which are reflective of changing patient needs and goals
- Consideration for community reintegration
- Services provided adhering to best and preferred practices

4. Patient centred rehabilitation should be guided via:

- Specific and realistic goals developed in conjunction with the patient, family, significant others and rehabilitation team
- Formal and regular interdisciplinary meetings
- Effective information dissemination across regional service providers and to the patient
- Active involvement of family and informal supports early on in the rehabilitation process
- Team support to patients for securing necessary funding for recommended equipment
- Patient and informal support awareness of resources and services in the community

5. Stroke Interdisciplinary Teams should be supported via:

- Opportunities for the development of clinical leadership by all members of the Team
- Knowledge transfer between Team members should occur regularly
- Identification of clinical leaders in various aspects and treatment areas associated with stroke rehabilitation should be identified for purposes of professional consultation, professional development potential, and local capacity building
- Regular and ongoing communication/collaboration across the continuum of care
- Training and professional development for staff for participation on the regional team

6. Rehabilitation assessment and treatment of stroke should be based on current evidence via:

- Use of New Brunswick and Canadian standards of preferred and best practice for stroke care and delivery of services
- Development of regional and inter-regional protocols and strategies
- Consideration of standards such as the Stroke Canada Optimization of Rehabilitation through Evidence (SCORE) Project

Community Reintegration

Community reintegration equates to the ability of the stroke survivor to live with the consequences of their stroke on a long term basis with the best possible quality of life and to the maximum potential possible. The reality is community reintegration represents the longest period of stroke survivorship when viewed from the perspective of the whole continuum of stroke. Often the focus of stroke services is targeted towards prevention, emergency and acute care, and rehabilitation issues. Community reintegration, when viewed from a pan-Canadian perspective, is an area that requires further development with input from stroke survivors and collaboration between government and community agencies.

Community reintegration is the transition from specialised stroke services provided in hospital to the community where the survivor lives, works, and socializes. This transition is a process that may be assisted for success prior to discharge through patient and family education, weekend visits home, and evaluation/modification of the home environment prior to the client leaving hospital. Given the age range of persons surviving stroke, it is important that the plans for community reintegration reflect age, functional abilities and their potential, roles at home and in the community, and associated social aspects demonstrated and expressed by the survivor.

Current Practice in New Brunswick

Community reintegration for stroke survivors is an area for further development in New Brunswick. There are differences in services throughout New Brunswick in terms of community services available and availability of peer support. Services available to survivors may include stroke survivor groups (currently provided in Saint John, and Moncton), meals on wheels, transportation support, and information available through Heart and Stroke New Brunswick. Many survivors are able to use private insurance policies to enhance services they receive following discharge from hospital, but the extent of services and benefits varies from company to company. Survivors eligible for DVA benefits often experience a more comprehensive range of benefits.

Best Practices in Community Reintegration

Community reintegration is characterized by several components which include:

- individualised goals based on the survivor's needs and priorities
- care coordination prior to and short term following discharge from hospital
- involvement of the survivor's support network in planning and implementing goals for community reintegration
- secondary prevention activities and goals
- prevention of crises and reduce stresses associated with returning to the community

- recognition and response to the varying education, training, and support needs as the client passes through various phases of community reintegration

Community reintegration is most successful via:

- effective care coordination
- survivor empowerment
- spouse/partner/family support
- inter-professional and inter-agency collaboration
- community capacity development
- peer support
- planned follow-up by professionals

“Rebuilding, reestablishing, or recreating a coherent self of self after stroke is a large part of what life after stroke is. Physical rehabilitation is only one aspect of life after stroke. Focusing rehabilitation on physical recovery misses much of what will allow stroke survivors and their families to adapt to life in the community and enable them to live a full life.” (Anderson, 2003)

Community Services

Stroke survivors face many challenges as they return to home. Many are returning with the effects of stroke that will alter their abilities to perform the roles they had previously at home, work, and socially. A common theme of many survivors as they return home is one of isolation and an observed lack of structured support following their discharge from hospital. As well as attempting to address physical needs as the result of stroke, survivors also face a range of new issues to address which include a new financial reality, transportation needs, loss issues related to employment and abilities, and a myriad of paperwork and documentation required for insurance companies and income support programs.

Stroke survivors report that continued access to rehabilitation services, counseling services, peer support, social opportunities, vocational support and assistance with financial planning to be important components for post discharge success. “Although hospital discharge planning programs provide information and in some cases skill training and emotional support to both stroke survivors and their family, needs often become more complex after discharge.” (Brazil et al. 2000)

Key Components: Pre Hospital Discharge Planning, Access to Rehabilitation Services Post Discharge, Survivor Awareness of Insurance Benefits/Options, Availability of Community Services, Survivor Awareness of Community Services, Community Capacity

Spouse/Partner/Family Considerations

The impact of a stroke extends beyond the survivor to the survivor's spouse/partner and other family members. "Family members who provide care for stroke survivors face their own adjustment difficulties, as they are required to sacrifice their own personal needs to meet those of the stroke survivor." (Bhogal, Teasall, Foley, Speechley 2003) Supporting the spouse/partner may take the form of homemaker services, respite, enhanced training and education for the survivor's care, transportation, counseling, peer support, and assistance with income support. Caregivers are also at risk for burnout and depression associated with the increased responsibilities of caring. Opportunities exist to assist in the prevention and reduction of informal support stress when assuming greater responsibilities in the household while also dealing with issues of loss associated with the stroke.

Key Components: Awareness and Access to Community Services, Coordinated and Integrated Government Services/Programs, Collaboration Between Government Services and Community Based Service Providers

Care Coordination

Care coordination is essential in all areas of the stroke continuum of care. However, in the community many survivors and informal supports find themselves essentially responsible for their own care coordination with limited empowerment to do so. Once at home comes the reality for stroke survivors of the true impact of their stroke on daily life. As the literature indicates, the survivor will go through various stages of information and education needs once discharged. Care coordination beyond hospitalization can be enhanced with effective pre discharge needs assessment, clear care pathways that extend beyond discharge, care plans that reflect ongoing support post discharge, ongoing family and team meetings, access to an information directory, and education of health providers.

"Community services related to the care of stroke survivors were rated more importantly by family caregivers than service providers. As well, service providers underestimated the difficulty caregivers experienced in locating appropriate community services." (Brazil et al., 2000)

Key Components: Care Coordination Beyond Discharge, Survivor Empowerment, Awareness of Community Services

Health and Lifestyle Maintenance

Health and lifestyle maintenance occurs during the course of hospitalization and the associated patient education programs provided in hospital. Long term health and lifestyle maintenance may be provided by health staff and stroke survivors through peer support and volunteer activities. Many community based organisations are actively involved with these activities, e.g. Heart and Stroke Foundation. Literature is lacking in the area of health and lifestyle maintenance

activities one year post discharge and beyond, however, stroke survivors interviewed for the development of this document indicated the need for regular and longer term structured activities. These activities highlighted included areas of diet/nutrition, fitness, social activities, and mental health.

Key Components: Survivor Self Management, Health and Lifestyle Maintenance Activities Long Term Post Hospitalization, Survivor Volunteer Opportunities With Other Survivors

Education for Service Providers

Community reintegration requires increased awareness and education for supporting survivor independence for community reintegration. Physicians frequently are the health professional who provides regular ongoing follow-up post discharge. However, the scope of this support is primarily to meet medical needs associated with the stroke. Rehabilitation professionals may also have regular appointments with survivors through out-patient or community based services. Community reintegration needs go far beyond solely medical and rehabilitation needs. Education and training for staff is necessary around topics such as supporting stroke survivors with communication impairments, raising awareness of the community services, and increasing knowledge of the “whole person” needs as they progress through the stages of community reintegration.

Key Components: Health Provider Knowledge of Community Reintegration

Recommendations for Community Reintegration

1. Increased recognition of stroke survivor needs in the community via:

- Care pathways that reflect community reintegration needs on a long term basis
- Effective and client centred pre discharge needs assessment with planned follow-up
- Education and training for health providers around topics related to community reintegration
- Collaboration with community based services
- Vocational counseling and training

2. Empowerment of stroke survivors via:

- Self management support programs
- Awareness of community services available post discharge
- Opportunities to volunteer and provide peer support for other stroke survivors

3. Collaboration and communication between government services and community based service providers via:

- Participation of community service providers on regional stroke planning committees
- Development of integrated and coordinated regional service delivery models
- Development of ongoing communication pathways between service providers
- Provincial government support of volunteer opportunities through liability protection legislation and waiving the fee required for criminal record checks

Self Management

Self management leads to a change in health related behaviours. Outcomes demonstrated via literature searches indicate a rating of personal efficacy in dealing with health issues as a result of effective self management support. Self management support goes far beyond educational experiences provided to patients. It may also include training for self care techniques, improving health monitoring abilities, and directly involves the patient to assume ownership and responsibility for their health status. Aspects of self management strategies can also be seen in recent public awareness campaigns such as smoking cessation and obesity where there is a consistent message of individual choice and ability to affect personal change are promoted to lead a healthier lifestyle and longer life. Self management support strategies can be applied to many health issues related to heart disease, depression, diabetes, and addiction to name a few.

Current Practice in New Brunswick

Professionals in the regional health authorities deliver a range of patient education and training in order to empower individuals to demonstrate more control and effective choice making in health prevention and management. These classes may include topics such as diabetes, hypertension, nutrition, etc. and may be provided to individuals as in-patients and/or out-patients by physicians, nurses, rehabilitation professionals, and other health providers. Service delivery sites may include the hospital, community health centres, and locations within the community.

Best Practices in Self Management

Self management “involves the patient engaging in activities that protect and promote health, monitoring and managing of symptoms and signs of illness, managing the impacts of illness on functioning, emotions and interpersonal relationships and adhering to treatment regimes.” (Center for Advancement in Health (1996). Indexed bibliography on Self-management for People with Chronic Disease. Washington D.C. Page 1)

Self management, while not an alternative to medical care, enhances the effectiveness of such care through:

- developing an individual’s commitment to modify behaviours to live a healthier lifestyle;
- participation by an individual in the identification of their health goals and objectives;
- a patient’s confidence to take a primary role in managing their health condition(s);
- empowering the individual to perform daily activities to manage their condition(s);

- patient education programs aimed at providing the information and skills necessary to manage their condition; and
- assisting individuals to adjust and plan for changes in their health and emotional status through time.

Patient Readiness

Patient readiness for accepting a role in self management of their condition needs to be determined by the professional team. Patient readiness may be determined through a demonstration of their understanding of their health needs, motivation, availability of support, emotional abilities, lifestyle, and expectations. Self management may be developed over a period of time as the patient moves along the continuum of care and self management tasks may vary across the continuum as well.

Key Components: Patient Ability to Take on Self Management Activities

Health Literacy

Knowledge does not equal behaviour change and the delivery of health information/education to patients must take into account their health literacy. Healthy People 2010 (<http://www.healthypeople.gov/>) defines health literacy as “The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.”

Health literacy involves tasks such as:

- evaluating information for credibility and quality,
- analyzing relative risks and benefits,
- calculating dosages,
- interpreting test results, or
- locating health information.

“In order to accomplish these tasks, individuals may need to be visually literate (able to understand graphs or other visual information), computer literate (able to operate a computer), information literate (able to obtain and apply relevant information), and numerically or computationally literate (able to calculate or reason numerically). Oral language skills are important as well. Patients need to articulate their health concerns and describe their symptoms accurately. They need to ask pertinent questions, and they need to understand spoken medical advice or treatment directions. In an age of shared responsibility between physician and patient for health care, patients need strong decision-making skills. With the development of the Internet as a source of health information, health literacy may also include the ability to search the Internet and evaluate web sites.” (<http://nmlm.gov/scr/conhlth/hlthlit.htm>)

Key Components: Literacy, Adult Learning Styles, Literacy Across Environments, Professional Awareness of Patient Literacy Issues

Self Management Skills

Self management skills demonstrated by an individual are generalisable across environments, assumes confidence yields better health outcomes, has as a goal increased self-efficacy, and can be taught by health professionals or peers. With these skills an individual has the ability to take care if their illness, carry out normal activities, and manage emotional changes

Self management may be viewed from the perspective of the five “A’s”:

- Assess: Beliefs, Behaviour, and Knowledge
 - Advise: Provide specific information about health risks and benefits of change
 - Agree: Collaboratively set goal’s based on the patient’s interest and confidence in their ability to change the behaviour
 - Assist: Identify personal barriers, strategies, problem-solving techniques, and social/environmental support
 - Arrange: Specify a plan for follow-up
- (Glasgow RE, et al (2002) Ann Beh Med 24(2):80-87.

Key Components: “Five A’s”, Client Empowerment

Client Centred

In order to fully realise the enhanced valued of client self management, the role of the client, health professional, and health service needs to evolve. It is the client who must take responsibility for the daily management, behaviour changes, emotional adjustments, and accurate reporting of disease trends and tempos. Health professionals, as well as serving the role of health advisor and partners in the conduct of medical management, also become facilitators in developing the patient’s management skills. The health service becomes the organiser and supporter of the these patient and health professional roles, focusing on assuring continuity of service and integration of care.

(Holman and Lorig, (2004) Public Health Reports, May June 2004, vol.119)

Key Components: Defining Roles Required for Self Management, Client Empowerment

Recommendations for Self Management

1. **Self management support should be viewed globally, across patient medical conditions and health issues via:**
 - Coordination of programs
 - Generic self management support programs
 - Empowerment of the client to participate in self management activities

- 2. Self management support should be incorporated as part of the philosophy of care via:**
 - Regional Health Authority delivery statements
 - Professional practice
 - Client communication and interactions

- 3. Self management should be a component of awareness for professionals and public alike via:**
 - Education and professional development
 - Public awareness activities

Appendix A
New Brunswick Integrated Stroke Strategy Advisory Committee
Membership

Dan Connolly (Co-Chair)
Executive Director
Heart and Stroke Foundation of New Brunswick

Cheryl Hansen (Co-Chair)
Director of Extra-Mural Program and Rehabilitation Services
Department of Health

Dr. Peter Bailey
Saint John Regional Hospital
Atlantic Health Sciences

Brigitte Chambers
Speech Language Pathology Department, Miramichi Regional Hospital
Miramichi Regional Health Authority

Penny Coburn
Pre-hospital Clinical Service Project Manager, Ambulance Services
Department of Health

Tom Fetter
Health Planning, Policy & Legislation
Department of Health

Patty Gallagher
Neuroscience Nurse Specialist, Saint John Regional Hospital
Atlantic Health Sciences

Moira Gagnon
Director of Health Promotion
Heart and Stroke Foundation of New Brunswick

Lise Guerrette-Daigle
VP soins infirmiers et soins aux patients
Régie régionale de la santé 1 Beauséjour

Dr. Shawn Jennings
Stroke Survivor

Doreen Légère
Manager of Rehabilitation Services, Miramichi Regional Hospital Facility
Miramichi Regional Health Authority

Marlien McKay
Public Health Project Manager
Department of Health

Peggy Norris-Robinson
Adults with Disabilities & Senior Services
Department of Family & Community Services

Dr. Colleen O'Connell
Stan Cassidy Centre for Rehabilitation

Debbie Peters
Planning and Medicare Services
Department of Health

Manon Roussel
Nurse Manager Assessment and Rehabilitation
Régie régionale de la santé 1 Beauséjour

John Serkiz
Stroke Navigator
Department of Health

Dr. Karen Silver
The Moncton Hospital
South East Regional Health Authority

Bernadette Thériault
VP Community Health Services
Acadie-Bathurst Regional Health Authority

Appendix B

New Brunswick Integrated Stroke Strategy Advisory Committee Terms of Reference

Purpose

To guide the development of a comprehensive integrated stroke strategy that incorporates stroke prevention, emergency and acute care, rehabilitation treatment, and community services. The goal is to have a stroke strategy document by March 2006.

Objectives

To identify existing gaps in stroke care and develop a comprehensive and effective provincial stroke strategy which includes:

1. Reviewing current practice of what is happening in other jurisdictions (Environmental Scan)
2. Identifying existing services in New Brunswick
3. Developing an integrated stroke strategy which builds upon current strengths while integrating best practices
4. Developing recommendations for implementation of the strategy including a communication strategy

Membership

- DHW Hospital Services – Co-Chair
- Heart and Stroke Foundation, Executive Director – Co-Chair
- Neurologist
- Physiatrist
- Family Physician
- Stroke Navigator (ex-officio)
- Representative from Emergency Department
- Representative from Occupational Therapy, Physiotherapy, Speech Language Therapy
- Representative from Nursing
- Representative from Ambulance Services
- Representative from Public Health
- Representative from Extra-Mural Program
- Representative from Family and Community Services
- Representative from Planning & Evaluation Division DHW
- Others as deemed appropriate by the committee
- Stroke survivor

All RHAs will be represented through membership.

Meetings

1. The committee shall meet a minimum of six times per year as deemed necessary. Meetings will be a combination of face to face and teleconferences.
2. The Co-Chairs, as required, can call additional meetings.

Quorum of the committee is 50% of the membership plus one.

Duties and Responsibilities of Co-chairpersons

1. Preside over all meetings of the NBISSAC
2. Determine the agenda and meeting dates with the assistance of the Stroke Navigator
3. Represent interest of the NBISSAC in conjunction with the Stroke Navigator

Duties and Responsibilities of Committee Members

1. Members are expected to maintain a high level of participation in meetings. No alternates will be appointed.
2. Bring forward agenda items to the Chairperson for inclusion at the next meeting.

Reporting Relationship

The committee will report to the ADM, Institutional Services and the Board of the Heart and Stroke Foundation of New Brunswick.

Appendix C Key Terminology

ADLS

Activities of Daily Living

Atrial Fibrillation

A type of heart arrhythmia in which the upper chamber of the heart quivers instead of pumping in an organized way. In this condition, the upper chambers (atria) of the heart do not completely empty when the heart beats, which can allow blood clots to form.

Care Coordination

With active patient/client participation; assessment, service delivery planning, service coordination (including community resources), supportive counseling, and empowerment to help persons and families cope with changes and/or health lifestyle choices with a goal for persons to develop the ability to manage their health needs and choices independently.

Chronic Disease Management

Chronic disease management (CDM) can be defined as a systematic, population-based approach to identify persons at risk, intervene with specific programs of care, and measure clinical and other outcomes.
(www.changefoundation.com)

Client

The term client refers to an individual who is involved with community based services. Client is considered in its broadest context referring to the individual's identified support system, e.g. spouse, partner, family, etc.

Community Capacity

Community capacity is defined as “the combined influence of a community's commitment, resources, and skills that can be deployed to build on community strengths and address community problems.” (*Building Community Capacity: The Potential of Community Foundations*, Steven E. Mayer. Published by Rainbow Research, Inc., 1995)

Continuum of Care

A comprehensive set of services ranging from preventive and ambulatory services to acute care to long term and rehabilitative services. By providing continuity of care, the continuum focuses on prevention and early intervention for those who have been identified as high risk and provides easy transition from service to service as needs change.
(www.dph.state.ct.us/OPPE/sha99/glossary.htm)

Cardiovascular Disease

All diseases of the circulatory system including acute myocardial infarction, ischemic heart disease, valvular heart disease, peripheral vascular disease, arrhythmias, high blood pressure and stroke. (Health Canada)

Dysphagia

Dysphagia is the medical term for any difficulty, discomfort or pain when swallowing. Dysphagia occurs when there's a problem with any part of the swallowing process in which food and liquid move from the mouth, through the throat, into the esophagus, and finally, into the stomach. (NHS, UK)

ECI

Early Childhood Initiatives

Emergency Medical Services (EMS)

Emergency medical service is a branch of medicine that is performed in the field, pre-hospital, (e.g., the streets, peoples' homes, etc.) by paramedics, emergency medical technicians, and certified first responders. (<http://en.wikipedia.org/wiki/>)

Empowerment

The process by which an individual is encouraged to increase control over, develop decision making skills, and make lifestyle choices to improve their health through education, demonstration, and/or modeling.

Health Literacy

The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. (Healthy People 2010)

HEPAC

Healthy Eating Physical Activity Coalition of New Brunswick

Hemorrhagic Stroke

About 20% of strokes are hemorrhagic. A hemorrhagic stroke is caused by uncontrolled bleeding in the brain. As well as interrupting the normal flow of blood within the brain, the uncontrolled bleeding "floods" and kills brain cells. There are two main types of hemorrhagic stroke: subarachnoid hemorrhage and intracerebral hemorrhage.

- A subarachnoid hemorrhage occurs when there is uncontrolled bleeding on the surface of the brain, in the area between the brain and the skull.
- In an intracerebral hemorrhage, an artery deep within the brain ruptures. High blood pressure is the main cause of intracerebral hemorrhage.

(HSF Canada)

Hypertension

Abnormally elevated blood pressure.

Ischemic Stroke

About 80% of strokes are ischemic. An ischemic stroke is the result of the interruption of the flow to blood to the brain by a blood clot. Doctors often refer to an ischemic stroke as being either "thrombotic" or "embolic."

- A thrombotic stroke is caused by a blood clot (thrombus) that forms in an artery going to the brain.
- An embolic stroke occurs when a brain artery is blocked by a clot that formed elsewhere in the body (an embolus) and is carried through the blood stream to the brain. For example, a blood clot can form in the heart and then travel through the blood vessels to the brain.

(HSF Canada)

Obesity

Determined through the evaluation of body fat content or body compositional analysis. For adult males, obesity has been defined as having a body fat content greater than 25% of total body weight. For adult females, having a body fat content of 30% or greater is considered obese. (Obesity Canada)

Patient

An individual who is in hospital or receiving hospital based services as an out-patient or through a day program. Client is considered in its broadest context referring to the individual's identified support system, e.g. spouse, partner, family, etc.

Primary Stroke Prevention

Education and lifestyle choices/changes that assist an individual in reducing the possibility of experiencing a stroke in their lifetime.

RHA

Regional Health Authority

Secondary Stroke Prevention

Secondary prevention refers to treatments or lifestyle changes that can help to reduce the risk of a recurrent stroke. (HSF Canada)

Self Management

Effective self-management support means more than telling patients what to do. It means acknowledging the patients' central role in their care, one that fosters a sense of responsibility for their own health. It includes the use of proven programs that provide basic information, emotional support, and strategies for living with chronic illness. Using a collaborative approach, providers and patients work together to define problems, set priorities, establish goals, create treatment plans and solve problems along the way. (M. Von Korff, J. Gruman, J.K.

Schaefer, S.J. Curry and E.H. Wagner, "Collaborative management of chronic illness," *Annals of Internal Medicine* 127 (1997): 1097-1102.)

Stroke

A stroke is a sudden loss of brain function. It is caused by the interruption of the flow of blood to the brain (an ischemic stroke) or the rupture of blood vessels in the brain (a hemorrhagic stroke). The interruption of the blood flow or the rupture of blood vessels causes brain cells (neurons) in the affected area to die. The effects of a stroke depend upon where the brain was injured. (HSF Canada)

Tissue Plasminogen Activator (t-PA)

An enzyme that helps dissolve clots.

Transient Ischemic Attack TIA

A Transient Ischemic Attack (TIA) is a temporary "mini-stroke". A TIA is caused by a temporary interruption of blood flow to the brain. The symptoms of a TIA are similar to an ischemic stroke except they go away in a few minutes or hours (no more than 24 hours). A TIA is an important warning sign that you may be at risk of having an ischemic stroke in the future.

Appendix D Internet Links

Canadian Diabetes Association
www.diabetes.ca/

Canadian Hypertension Society
www.hypertension.ca/

Canadian Stroke Network
www.canadianstrokenetwork.ca/

Chronic Care Illness
www.improvingchroniccare.org/

Department of Family and Community Services
www.gnb.ca/0017/index-e.asp

Department of Health
www.gnb.ca/0051/index-e.asp

Department of Wellness, Culture, and Sport
www.gnb.ca/0131/index-e.asp

Healthy Eating Physical Activity Coalition of NB (HEPAC)
<http://en.hepac.ehealthlabs.ca/metadot/index.pl>

Heart and Stroke Foundation Canada
ww2.heartandstroke.ca/

Heart and Stroke Foundation New Brunswick
ww2.heartandstroke.ca/Page.asp?PageID=28&SiteLanguageID=1&CategoryID=17

NB Anti-Tobacco Coalition (NBATC)
www.nbatc.ca/

Obesity Canada
www.obesitycanada.com/

Provincial Health Plan
www.gnb.ca/0051/pdf/healthplan-2004-2008_e.pdf

Stanford Self Management Programs
<http://patienteducation.stanford.edu/programs/>

New Brunswick Integrated Stroke Strategy

Statistics Canada
www.statcan.ca/

Stroke Directory
www.stroke-info.com/

Stroke Engine
www.medicine.mcgill.ca/strokengine/

Success NB
www.snbs.gnb.ca/

Wellness Strategy
www.gnb.ca/0055/wellness_strategy/index-e.asp

World Health Organisation
www.who.int/en/