

Creating a Canadian stroke system

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Stroke accounts for 7% of all deaths in Canada.¹ The overall mortality rate is 47.8 per 100 000 population. In people aged 65–69 years, the rate is 73.4 per 100 000 population. The rate gradually increases to 2003 per 100 000 population for those aged 90 years and over.² High life expectancy and an aging population will substantially increase the number of people afflicted with stroke in the coming years. At the moment, 4.1% of all individuals 65 years of age and over are living with the effects of a stroke.³ Stroke is estimated to cost \$2.7 billion a year (from direct and indirect costs in 1993), that is, about 2.1% of all health care expenditures in Canada.⁴

Despite the high morbidity, mortality and health care costs associated with this disease, stroke has, until recently, received very little attention from researchers or the medical profession. Until now, there were very few treatment options available that could reduce the acute effects of a stroke, and only a few centres had developed treatment protocols and stroke treatment units.

All of this changed dramatically when the results of the randomized controlled clinical trial of tissue plasminogen activator⁵ carried out by the National Institute of Neurological Disorders and Stroke in the United States indicated that treatment of stroke during the first 3 hours of onset improves long-term outcome and, in some cases, completely reverses the effects of the stroke. This information, coupled with evidence from the Stroke Unit Trialists Collaboration^{6,7}

that specialized stroke units result in improved survival and reduced morbidity, led to a major evaluation of stroke care in Canada and recommendations for improvement.

Under the leadership of the Heart and Stroke Foundation of Canada, Health Canada's Laboratory Centre for Disease Control and the Canadian Stroke Society, a working group of representatives from principal stakeholder organizations was convened in June 1997 to discuss strategic priorities for stroke prevention and management. Participants agreed that the development of an effective and efficient response to stroke requires a systems approach, which defines and describes the essential components and arranges them systematically to form an effective whole. From these beginnings, the Canadian Stroke Systems Coalition was created to promote a systems approach to the prevention and control of stroke (see end of article for a list of member organizations). In this overview, we outline the action required in each component of an integrated stroke system and identify what is needed to link the components. Our purpose is to summarize briefly the Coalition's recommendations and to urge communities and physicians across the country to set about their implementation.

In order to tackle this important problem, Canada needs a comprehensive, effective and efficient approach to stroke. This must include prevention, pre-hospital and emergency care, hospital care, rehabilitation, pre-hospital and emergency care, hospital care, rehabilitation, reintegration into the community, surveillance and research (Fig. 1).

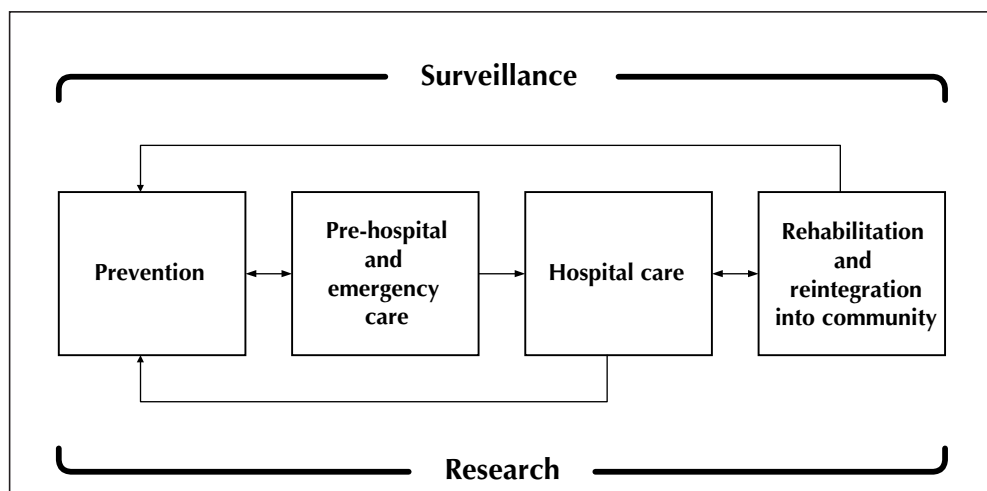


Fig. 1: A conceptual framework for a systems approach to stroke care.

Prevention involves the development of health behaviours such as regular physical activity, the maintenance of healthy body weight, the cessation or avoidance of smoking and avoidance of heavy alcohol use, and the early detection and control of hypertension.⁸ In addition, predisposing conditions for stroke such as acute myocardial infarction,⁹ atrial fibrillation,¹⁰ diabetes mellitus¹¹ and hypercholesterolemia¹² must be treated.

The prevention, detection and treatment of behavioural risk factors in the Canadian population has been suboptimal. About 75% of the adult population have at least one of the lifestyle risk factors,¹³ and 25% of men and 18% of women have high blood pressure. Almost half (42%) are unaware of the fact that they have high blood pressure.¹⁴

Stroke prevention programs should be integrated into existing community-based programs.¹⁵ Such programs, which are usually organized within heart health programs, involve public health departments, health care facilities such as physicians' clinics and hospitals, and other organizations such as community groups and local Heart and Stroke Foundation chapters.

In pre-hospital and emergency care, patients with impending stroke have to receive urgent attention. Thrombolytic therapy should be administered as soon as possible after the diagnosis is established, and no later than 3 hours after stroke onset.¹⁶ This involves several prerequisites. First, patients and their families must be able to recognize the signs and symptoms of stroke and must be aware of the importance of seeking urgent attention. Patients with unusual paresthesias or sudden loss of motor function must not be put to bed in the hope that they will get better.

Physicians who care for patients in emergency settings should recognize the importance of prompt clinical assessment and CT scanning to distinguish ischemic stroke from intracerebral hemorrhage and to diagnose other conditions that may mimic stroke. Upon a patient's presentation in the emergency department, bedside blood glucose testing should be performed to exclude hypoglycemia as the cause of a "stroke mimic" presentation.¹⁷ Medical evaluation of the patient that includes assessment of blood pressure, neurologic deficit, oxygen saturation and cardiac rhythm is required. All stroke patients should receive nothing by mouth until their ability to swallow has been assessed. Protocols for finding and treating the source of fever and controlling hyperglycemia with oral hypoglycemic agents or insulin should be standard. Even in the absence of new pharmacologic interventions, a standardized approach to the patient with stroke in the emergency department can be beneficial.

In order to achieve standardized patient care for the treatment of stroke, a stroke care system will need to be established so that patients, no matter where they live, can be seen quickly, can be transported to the nearest facility with a CT scanner and, upon completion of the scan, can receive urgent consideration for thrombolytic therapy and admission to a stroke unit. Ambulance dispatchers will require training so that patients with acute stroke are man-

aged as emergencies. Emergency departments need to develop protocols for urgent investigation and therapy.

It has been shown that patients in specialized stroke units that provide acute medical care and rehabilitation treatment have a better long-term prognosis (and shorter hospital stays) than similar patients treated on general medical wards.¹⁸ More specialized stroke units need to be developed and staff trained to work in these units.

Rehabilitation requires a multidisciplinary team trained specifically to manage the problems of patients recovering from stroke.¹⁹ Stroke rehabilitation programs should be available for all patients with stroke, and these services should extend beyond hospital walls. Financing for rehabilitation services should not be limited to in-hospital rehabilitation programs. The goal of rehabilitation is to reintegrate survivors of stroke back into their communities. About 60% of patients with stroke will survive the acute stroke and will return to their homes.^{18,20} Reintegration involves ensuring the patient's mobility, including travel within the community, and attention to the patient's emotional well-being with the provision of opportunities for taking part in purposeful activities.

Lastly, we need to conduct more research into all aspects of stroke to further develop and enhance the Canada-wide surveillance system. Surveillance is essential to monitor factors associated with stroke and to provide information about the effectiveness of policy and programs that are implemented to reduce stroke-related morbidity and mortality. Data collection should be a part of routine stroke management, and this information should be made available to health care planners at all levels.

Stroke, which is increasingly a treatable disease, calls for a multidisciplinary approach spanning prevention, emergency and in-hospital care, rehabilitation and community care.²¹ A coordinated approach is essential to integrate these multiple levels of care and services more effectively. The Canadian Stroke Systems Coalition has made specific recommendations for the development of a national approach to stroke. We urge physicians at all levels of the health care system to get involved in this effort.

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Member organizations of the Canadian Stroke Systems Coalition: Canadian Society of Epidemiologists and Biostatisticians; Canadian Association of Emergency Physicians; Canadian Association of Neuroscience Nurses; Canadian Association of Occupational Therapists; Canadian Association of Speech and Language Pathologists and Audiologists; Canadian Cardiovascular Society; Canadian Coordinating Office for Health Technology Assessment; Canadian Congress of Neurological Sciences; Canadian Council of Cardiovascular Nurses; Canadian Healthcare Association; Canadian Medical Association; Canadian Physiotherapy Association; Canadian Stroke Society; Chief Medical Officers of Health; College of Family Physicians of Canada; Population and Public Health Branch, Health Canada; Heart and Stroke Foundation of Canada; Heart and Stroke Foundation of Ontario; Institute for Clinical Evaluative Sciences; Society of Rural Physicians of Canada; Victorian Order of Nurses; and the World Health Organization, Collaborating Centre, Saskatoon, Sask.