

# Is Canada falling behind international standards for stroke care?

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For too long, the image of stroke in both popular and medical writing has been of devastating, uncontrollable events that can be neither prevented nor treated. It is time to lay these pessimistic attitudes to rest. Evidence-based medicine has shown that, given the will and the resources, many strokes can be prevented,<sup>1-3</sup> and those that do occur can be effectively treated.<sup>4,5</sup> Neuroprotective and thrombolytic agents are waiting in the wings, but even without these innovations, a lot can be done with our current technology and knowledge to reduce the mortality and morbidity caused by stroke. Research indicates that even *without* new agents or technologies there are short- and long-term benefits to patients when care is centralized and rationalized into organized stroke care.<sup>6-8</sup> What we need are opportunities for physicians to learn about effective interventions and physician leadership to promote the reorganization and more effective use of those that already exist.

The Heart and Stroke Foundations believe that physician leadership, supported by concerted action at the national, provincial and local levels, is needed to reorganize stroke resources so they are used to their maximum efficiency. It will take a significant investment of time and effort to minimize the burden of stroke. As readers of the supplement published with this issue of *CMAJ* will discover, stroke presents a considerable human and financial burden to society. Each year, there are approximately 50 000 strokes in Canada, and close to 300 000 Canadians are stroke survivors.<sup>9</sup> Stroke incidence is age-related, and the number of strokes is projected to increase as the Canadian population ages, unless there are dramatic improvements in prevention and treatment. As documented by Chan and Hayes,<sup>10</sup> in Ontario alone stroke is responsible for direct and indirect costs of almost \$1 billion a year. When all cerebrovascular disease is considered, the annual national total is \$2.7 billion.<sup>11</sup>

With a few exceptions, the current Canadian health care system is poorly equipped to deal with stroke. Despite the sophistication of our medical facilities and the best efforts of physicians, the country is at risk of falling behind international standards for stroke care. The type of care a patient with stroke receives is far too frequently a function of where he or she lives and, thus, the resources that happen to be available.

The current state of disorganization that characterizes stroke care in Canada is a shaky, even dangerous, foundation from which to introduce new technologies. There is a risk that inequalities in the treatment of stroke will increase rather than decrease as new technologies become available.<sup>12</sup> This would seriously compromise the positive impact such agents could have on society.

How can we remedy this situation and enable physicians to deliver the best possible stroke care? We know that organized stroke care makes a difference. "Organized stroke care" is a multidisciplinary, collaborative and integrated health care system designed to ensure optimal (high-quality, standardized, efficacious, cost-effective and evidence-based) patient care. It can take several forms, depending on local resources. The principles and components of organized stroke care can be applied by individual physicians using a stroke care guide, by a stroke team, by an acute stroke care unit or by a full-service stroke centre offering neurosurgery and interventional radiology.



*Editorial*

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‡ See supplement to this issue



Organized stroke care extends well beyond what physicians do for stroke patients in the hospital. It covers the spectrum from primary prevention to rehabilitation to secondary prevention. It is true that prevention is the best "cure" for stroke. The risk factors of hypertension, cigarette smoking and heart disease have been known for decades, yet hypertension is not always treated appropriately.<sup>13</sup> New risk factors for stroke and primary protective measures against it have also become clearer. Atrial fibrillation is associated with increased risk for stroke,<sup>14</sup> and the current recommendation is to administer anticoagulants to most patients with this condition (to an international normalized ratio of approximately 3.0) to reduce the risk.<sup>15</sup> A carotid stenosis of more than 70%, when accompanied by symptoms of a transient ischemic attack, or of more than 90% in asymptomatic patients, should be corrected surgically. Current studies may determine whether stenting and angioplasty are equally effective. Recent meta-analyses of randomized controlled trials have suggested that therapy with HMGCoA (3-hydroxy-3-methylglutaryl-coenzyme A) reductase inhibitor reduces the incidence of stroke in patients with coronary artery disease,<sup>16,17</sup> which has reignited the controversy over the effectiveness of cholesterol-lowering drugs in primary prevention of stroke. Simple measures may also be effective as primary prevention tools. For example, eating fruits and vegetables is inversely related to the incidence of both hemorrhagic and non-hemorrhagic stroke.<sup>18</sup>

The ability of the medical community to help patients with stroke reintegrate into society by improving their functioning is an important element in organized stroke care. The biological mechanisms underlying recovery are now being explored, but it is already clear that functionally useful recovery does not occur in the central nervous systems of adults who have had a stroke.<sup>19</sup> The current reality is that in approximately 70% of patients the ability to walk is affected, and 3 months after the stroke, up to one-third will still require help or supervision to walk.<sup>20,21</sup> The impact of stroke is not limited to the patient, but extends to the family caregiver; 50% of all caregivers develop an emotional illness within a year.<sup>22</sup>

The myth that stroke patients cannot benefit from therapy in the acute phase has been disproven by the recent National Institute of Neurological Disorders and Stroke study,<sup>23</sup> which showed that tissue-plasminogen activator (t-PA) given in the first 3 hours after a stroke reduces the number of patients with severe disability and increases the number of those who are left without deficit — despite a 10-fold increase in intracerebral hemorrhage. Other thrombolytics and neuroprotective drugs will become available, but t-PA will increase the need for people to recognize the symptoms of stroke and react to them appropriately. "Time is brain," so it is necessary to iden-

tify those hospitals with the resources to administer t-PA safely in the acute phase and to improve the ability of others to do so. A database to monitor the reasons people delay going to hospital when they experience the onset of symptoms of stroke, and to test the effectiveness of educational programs to counteract the reasons for delays, is important. Clearly, continuing medical education is needed to ensure that treatment regimes are evidence-based and current. As well as traditional forms of continuing education, new techniques and media such as the Internet are available.<sup>24</sup> An educated, proactive public is an essential first step to better stroke care.

A new era in stroke prevention, treatment and recovery is upon us. A proposal to establish a Canadian Network of Centres of Excellence in Stroke is now being evaluated. Its success would ensure a coordinated approach to the treatment of patients with stroke in Canada, and would forge a partnership among scientists, clinicians, the Heart and Stroke Foundation of Canada and industry. As health care professionals, physicians must work, through the provincial Heart and Stroke Foundations, with their ministries of health to bring about changes that are systemic and that can lead to the integration of prevention, treatment and rehabilitation services.

Each effort is important in its own right, but maximum impact can only be achieved through coordinated and simultaneous action on all fronts. In Ontario, for example, physicians have joined with the Heart and Stroke Foundation of Ontario to develop a framework for action on stroke and, together with the Ontario Hospital Association, the Institute for Clinical Evaluative Sciences and the Ministry of Health, to compile an inventory of stroke care resources in all hospitals across the province. At the national level a Stroke Systems Coalition has been formed by the Heart and Stroke Foundation of Canada, the Canadian Stroke Society and the Laboratory Centre for Disease Control at Health Canada. Its mission is to provide leadership in the development of a coordinated, national approach to a comprehensive and integrated stroke system in Canada. The leadership of Canadian physicians is critical. Physicians, whether as clinicians, advisors or advocates, must work to ensure that stroke is recognized as a medical emergency. "Brain attack" should become as urgent a matter for our health care system as heart attack.

The Heart and Stroke Foundation of Ontario hopes that this supplement to *CMAJ* will help to bring the issue of stroke to the forefront and fuel the process of change.

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