

Stroke Care in Ontario: Hospital Survey Results



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EXECUTIVE SUMMARY

Recent developments in the treatment of acute stroke have led to a recognition of the need to develop a new approach toward the assessment and management of stroke patients. With the goal of improving the quality of stroke care in Ontario, a committee comprising representatives from the Institute for Clinical Evaluative Sciences (ICES), the Heart and Stroke Foundation of Ontario (HSFO), the Ontario Hospital Association (OHA), and the Ontario Ministry of Health (MOH) conducted an inventory of stroke care programs at acute and rehabilitation/chronic care hospitals in Ontario. A 35-question survey covering the spectrum of stroke care was distributed to 190 hospitals in Ontario. The survey was designed to capture information on many issues including the types of hospital resources and programs available for stroke patients, access to rehabilitation resources and imaging technology, the readiness of hospitals to administer thrombolytic therapy, and regional referral patterns. This report represents an initial analysis of the survey responses and focuses on the major findings. Regional level analyses will be conducted at a later date by the sponsoring organizations. Highlights from the survey are presented below.

The overall response rate to the survey was 77%. Twenty-four per cent of responding acute hospitals reported having a care map for stroke patients while 36% were in the process of developing one. Acute stroke patients were admitted to a general medical ward at the majority of responding acute hospitals (71%). Only 4% of acute hospitals reported having a dedicated stroke unit. Family physicians were the attending physicians for stroke patients at 78% of the acute hospitals. At 12% of responding acute hospitals neurologists were the attending physician although these specialists served as consultants at 39% of the acute sites. Most hospitals reported timely access to acute rehabilitation services with a median inpatient waiting time of 2 days for each of physiotherapy, occupational therapy, and speech pathology. Waiting times for outpatient stroke rehabilitation and stroke rehabilitation provided through home care were longer than inpatient access to these services, with median waits of 7 - 11 days, depending on the rehabilitation specialist type and program. Waiting times for an urgent CT scan of the head varied from a median wait of 2 hours at hospitals with a CT scanner to 12 hours at hospitals without a scanner. Twenty-two acute hospitals (16%) in Ontario currently administer thrombolytic therapy to some acute stroke patients with another 16 sites (11%) planning to offer it within the next 12 months. Stroke patients in acute hospitals faced significant waiting times for transfers to other institutions with a median wait of 14 days for transfer to rehabilitation hospitals and 45 days to long-term care institutions.

Stroke is a complex and devastating disease that presents an enormous burden to patients, families, and the Canadian health care system. Management of stroke requires a multi-disciplinary approach supported by an integrated care delivery system. The survey results demonstrate wide inter-institutional variations in access to various types of stroke diagnostic services and treatments in Ontario. Further work is needed to determine the impact of these variations on patient outcomes, and to develop a better coordinated stroke care delivery program in Ontario.

INTRODUCTION

Stroke is the third leading cause of death and the leading cause of long-term disability in Canada. Each year, it is estimated that 50,000 Canadians experience a stroke at a projected cost to the Canadian health system of \$2.7 billion.¹ In Ontario alone, total stroke-related costs in 1994/95 have been estimated at \$857 million.¹ The number of patients hospitalized for stroke in Ontario has gradually increased from 14,147 in 1992 to 15,243 in 1996 (Table 1). However, over the same time period there has been little change in the outcomes for patients with this condition. In 1992, the 30-day mortality rate for acute stroke patients was 19.5% vs. 19.2% in 1996 (Table 2). Of those who survive a stroke, many patients are left with significant disability necessitating permanent institutionalization. The discharge disposition of stroke survivors to various types of institutions in Ontario between 1992 and 1996 is shown in Table 3.

Table 1: Number of stroke admissions in Ontario, by age and sex, 1992-1996*

	MALES			FEMALES			TOTAL
	20-64	65-74	75+	20-64	65-74	75+	
1992	1722	2362	2861	1099	1724	4379	14147
1993	1855	2407	3153	1105	1866	4630	15016
1994	1752	2433	3222	1100	1900	4447	14854
1995	1787	2424	3235	1171	1795	4550	14962
1996	1835	2379	3317	1176	1804	4732	15243

* Patients admitted to hospital with a most responsible ICD-9-CM diagnosis code: 431, 434, 436
Source: Canadian Institute for Health Information

Table 2: 30-day mortality by age and sex, following a stroke in Ontario, 1992-1996*

	MALES			FEMALES			TOTAL
	20-64	65-74	75+	20-64	65-74	75+	
1992	13.7	15.1	23.7	9.7	15.8	25.5	19.5
1993	12.1	15.5	24.3	11.5	14.9	25.2	19.6
1994	10.8	15.5	24.8	10.8	16.1	23.8	19.2
1995	9.4	15.3	25.9	10.6	13.8	24.5	19.1
1996	8.5	14.1	25.5	11.1	16.1	24.7	19.2

* All values are percentages
Source: Canadian Institute for Health Information and the Registered Person Database

Table 3: Discharge disposition for stroke survivors in Ontario, 1992-1996*

	1992	1993	1994	1995	1996
Acute Care Hospital	7.6	6.7	6.5	6.1	5.8
Chronic Hospital	11.2	12.3	12.5	11.7	11.3
Rehabilitation Hospital	11.1	11.5	13.0	13.0	14.7
Nursing Home/Home for the Aged	9.3	8.9	8.7	8.7	9.4
Home/Home Care	59.5	59.1	58.2	59.2	57.6
Other	1.3	1.6	1.2	1.3	1.3

* All values are percentages
Source: Canadian Institute for Health Information

While there has historically been an attitude of “therapeutic nihilism” among health care providers toward stroke patients, advances in acute stroke treatment have led to new optimism in the field. The recent National Institute of Neurological Disorders and Stroke (NINDS) trial of the thrombolytic agent recombinant tissue-type Plasminogen Activator (rtPA), showed that rapid administration of rtPA to acute stroke patients within 3 hours of stroke onset significantly decreased the proportion of patients with residual long-term disability, although there was an increased risk of intracerebral hemorrhage.² Meta-analyses of randomized clinical trials have also shown that “organized stroke care” in acute stroke units rather than treatment on a general medical ward resulted in decreased deaths and long-term disability.³ These developments have led to the recognition that a new approach to the management of stroke patients is needed.

In 1996, the Heart and Stroke Foundation of Ontario (HSFO) convened a working group of multiple stakeholders interested in stroke care with the goal of developing a coordinated stroke strategy for the province of Ontario. A lack of information on stroke care delivery in Ontario meant that as an important first step in developing a provincial strategy, a survey of current stroke care programs in Ontario hospitals would have to be conducted. Accordingly, a committee with representatives from the Institute for Clinical Evaluative Sciences (ICES), the Ontario Hospital Association (OHA), the Heart and Stroke Foundation of Ontario, and the Ontario Ministry of Health (MOH) was formed with a mandate to conduct the survey.

METHODS

Survey design

At the initial meeting of the committee, it was decided that ICES would take the lead in drafting and developing the stroke survey instrument and that the information gathering would cover a broad range of topics related to stroke care delivery in Ontario hospitals. A draft survey underwent extensive revision following discussion by various members of the committee and pilot testing at 8 hospitals.

The revised survey was mailed out by the OHA to all of its member hospitals in June, 1998. The person most responsible for stroke care at each hospital was asked to complete the survey and return it by July, 1998. Respondents were asked to answer questions based on their hospital's status as of March 31, 1998 or for fiscal year 1997 (April 1, 1997 to March 31, 1998), as appropriate. A waiver, allowing the sponsoring organizations to analyze the results of the survey, was also included with the survey with the understanding that hospital-specific results would not be publicly released without the prior consent of the hospital. The completed surveys were returned to the OHA where they underwent an initial screening for completeness. In cases where the waiver was unsigned, data were missing, or a question was misinterpreted, hospitals were contacted by the OHA for additional information. Follow-up was conducted with hospitals that did not respond and more time was given to facilitate their participation. The survey responses were entered into a database at ICES and a descriptive analysis was conducted.

As with any survey, it should be noted that the information provided by hospital respondents represent "self-reported" data. In several instances, respondents were asked to estimate the average waiting time for various stroke-related tests or services, therefore, some responses may not be precise as these were best estimates based on experience. Independent confirmation of the information provided was not possible. In cases where participating hospitals indicated a numerical range in response to an individual question, the average of the reported range was used.

This report represents an initial analysis of the survey responses and focuses on the major findings. As the survey contained over 35 questions, only the results related to a number of key topics are presented. Additional analyses of survey responses at a regional level will be conducted at a later date by the sponsoring organizations.

Response rate

A total of 190 surveys were sent to OHA member hospitals with 172 directed to acute hospitals and 18 to rehabilitation and/or chronic care institutions. Federal and provincial psychiatric hospitals were excluded from the survey. Hospitals with multiple sites were asked to return a survey for each site where stroke patients were treated. Overall, 146 hospitals returned 157 surveys for a response rate of 77% (6 hospitals submitted more than one survey, which resulted in a total of 140 acute and 17 rehabilitation/chronic care responses). In the analysis, each site was considered to be a separate hospital. The hospitals that participated in the survey are listed in the Appendix.

The survey responses were subset and analyzed by type of hospital (i.e., acute or rehabilitation/chronic care). As many of the survey questions were related to acute stroke treatment, the analysis has, for the most part, been restricted to the 140 acute hospital responses. Due to the small number of institutions involved, responses from the 17 rehabilitation and chronic care hospitals have been combined and analysed separately from the acute hospitals. The results of the rehabilitation/chronic care analysis should be interpreted with caution in light of the small sample. Acute hospitals which also had rehabilitation or chronic care sites were considered to be acute care hospitals for the purposes of this analysis.

RESULTS

Care maps and stroke teams

Care maps are increasingly being used to organize and streamline the efficiency with which stroke and other medical conditions are managed. Of the 140 acute hospitals responding to the survey, 34 hospitals (24%) reported having a stroke care map and another 50 hospitals (36%) advised that they were in the process of developing one. Twenty-nine of the 34 hospitals with a care map indicated that they would be willing to share their map with other hospitals in the province. With respect to rehabilitation/chronic care institutions, 4 sites have implemented care maps while 6 are currently in the development stage. Given the significant amount of time and resources involved in creating care maps, opportunities appear to exist for hospitals to assist each other in the development process. However, it should be recognized that any care map may need to be customized to reflect the unique aspects of each institution. Thirty-nine of the responding acute hospitals (28%) currently have a formal stroke team on-site (defined as a multidisciplinary team responsible for looking after stroke patients), while 57 hospitals (41%) indicated the presence of a staff physician with a special interest in stroke patients.

Type of ward where stroke patients are admitted

Recent studies have suggested that acute stroke patients admitted to a dedicated stroke unit have better outcomes than those treated on a general medical ward.³ However, the factors associated with a better outcome on a stroke unit remain uncertain and the need for such units is not universally accepted. Hospitals were asked to indicate the type of ward where the majority (>50%) of stroke patients were admitted in fiscal year 1997/98. As shown in Table 4, at acute hospitals, a general medical ward was by far the most common site (71%) while at rehabilitation/chronic care institutions, a stroke unit

Table 4: Usual ward of admission for stroke patients in acute and rehabilitation/chronic care hospitals in Ontario, 1997/98

WARD OF ADMISSION	ACUTE SITES REPORTING (n=140)	REHAB/CHRONIC SITES REPORTING (n=17)
General Medicine	100 (71%)	1 (6%)
General Rehabilitation	5 (3%)	3 (18%)
General Neurology	5 (3%)	—
Stroke Unit	6 (4%)	7 (41%)
Other	24 (17%)*	7 (35%)**

* Most hospitals listed 2 or more sites to which stroke patients are admitted. For example, 10 hospitals indicated General Medicine with one other destination site including General Rehabilitation or Chronic.

** For example, Reactivation and Restoration Units, or slow stream Neuro-Rehab and chronic care units.

was the most frequent ward of admission (41%). A considerable number of acute and rehabilitation/chronic care hospitals also selected the “Other” category in response to this question and indicated that patients were admitted to a combination of a general medical ward and some other type of ward (e.g., general rehabilitation, chronic, etc.). Only 4% of acute care hospitals reported having a dedicated stroke unit, ranging in size from 4 to 16 beds.

Type of physician caring for stroke patients

With the advent of thrombolytic therapy for the treatment of acute stroke patients, the availability of specialist care (i.e., neurologists) is an important consideration. To gather information on this issue, each of the participating hospitals was asked to indicate the type(s) of physician attending stroke patients, as well as the specialties of available consulting physicians. As shown in Table 5, family physicians were the most frequent type of attending physician at both acute and rehabilitation/chronic care hospitals. Seventy-eight per cent of acute and 65% of rehabilitation/chronic care sites responded that family practitioners were the attending physician for the majority of stroke patients. Only 12% of responding acute hospitals indicated that a neurologist was the attending physician although 39% reported this specialist type was available as a consulting physician at their hospital. At 21% of the acute and 41% of the rehabilitation/chronic care hospitals, a physiatrist (i.e., rehabilitation specialist) was available for consultation. Eighty per cent of responding acute hospitals in Ontario also reported that family physicians were responsible for providing follow-up care for stroke patients. The impact of these various specialty and generalist physician mixes on stroke outcomes remains to be determined. However, the results do highlight the important role played by family physicians in the acute management of stroke patients in Ontario.

Table 5: Specialty of attending and consulting physicians for the majority of stroke patients in acute and rehabilitation/chronic care hospitals in Ontario, 1997/98

SPECIALTY	ACUTE HOSPITALS* (n=140)		REHAB/CHRONIC CARE HOSPITALS* (n=17)	
	ATTENDING	CONSULTING	ATTENDING	CONSULTING
Neurologist	17 (12%)	54 (39%)	—	7 (41%)
Internist	28 (20%)	86 (61%)	1 (6%)	4 (24%)
Family Physician	109 (78%)	9 (6%)	11 (65%)	4 (24%)
Physiatrist	7 (5%)	30 (21%)	5 (29%)	7 (41%)
Other	5 (4%)	15 (11%)	3 (18%)	4 (24%)

*Majority of stroke patients' is defined as > 50%

* May not add to 100 as some hospitals indicated physicians of more than one specialty type attending or consulting.

Access to stroke rehabilitation services

Rehabilitation, following an acute stroke, is an important factor in the recovery process for stroke patients, many of whom have significant disability. While assessment of the quality of rehabilitation services provided to stroke patients was beyond the scope of this survey, a number of questions were asked about the timeliness with which stroke patients receive rehabilitation in Ontario acute care hospitals. The average waiting time for the three most common types of stroke rehabilitation specialists (physiotherapists, occupational therapists, and speech language pathologists) at acute care hospitals is shown in Table 6. Most hospitals reported timely access to acute rehabilitation services with a median waiting time of 2 days for physiotherapy, occupational therapy and speech pathology. However, there was variation in the responses with some hospitals reporting average patient waiting times as long as 7 days for acute physiotherapy, 8 days for occupational therapy, and up to 18 days for speech pathology.

The timeliness of access to outpatient stroke rehabilitation and stroke rehabilitation provided by home care programs was also assessed (Table 7). There was substantial variation in the hospitals' reported responses with a median waiting time of 7 days for each of: physiotherapy (range 1 to 105 days), occupational therapy (range 1 to 43 days) and speech pathology (range 1 to 120 days). Similar ranges of waiting times were reported for occupational therapy and speech rehabilitation via the home care program. Interestingly, the maximum waiting time for home care physiotherapy was approximately one-third of the maximum waiting time for outpatient physiotherapeutic services.

These wide variations suggest a need to develop evidence-based guidelines for stroke rehabilitation in Ontario. The guidelines should include the appropriate indications for physiotherapy, occupational

Table 6: Distribution of the average waiting time for assessment by rehabilitation specialists in acute hospitals in Ontario, 1997/98

AVERAGE WAITING TIME (DAYS)			
	PHYSIOTHERAPIST (n=137)	OCCUPATIONAL THERAPIST (n=94)	SPEECH PATHOLOGIST (n=91)
25 Percentile	1	1	1
Median	2	2	2
75 Percentile	2	3	4
Range	1-7	1-8	1-18

Table 7: Distribution of the average waiting time for rehabilitation specialists after discharge from acute hospitals in Ontario, 1997/98

	OUTPATIENT REHABILITATION SERVICES (AVERAGE WAIT IN DAYS)			HOME CARE REHABILITATION SERVICES (AVERAGE WAIT IN DAYS)		
	PT (n=108)	OT (n=75)	SP (n=63)	PT (n=107)	OT (n=105)	SP (n=83)
	25 Percentile	2	3	4	3	5
Median	7	7	7	7	7	11
75 Percentile	11	14	18	14	14	18
Range	1-105	1-43	1-120	1-30	1-49	1-135

PT - Physiotherapist
 OT - Occupational Therapist
 SP - Speech Pathologist

therapy, and speech pathology, and articulate the maximum acceptable waiting time for each of these rehabilitation services. Based on the guidelines, strategies should be developed to ensure that rehabilitation wait times across the province are within acceptable limits.

Imaging technology for stroke patients

CT (computed tomography) and MRI (magnetic resonance imaging) scans are important tests for diagnosing the cause of an acute stroke. CT scans are used to rule out an intracerebral hemorrhage, and to determine the location and etiology of a stroke. MRI scans may be particularly useful in assessing brain stem strokes and other conditions that mimic stroke, such as multiple sclerosis. However, CT scanners and MRI machines are not available at all Ontario hospitals. Of the acute hospitals responding to the survey, 59 reported having a CT scan and 22 reported having a MRI scan. Twenty-two acute hospitals (16%) reported the presence of a neuroradiologist, while at 51 hospitals (37%) an interventional radiologist was on-site.

Each of the responding hospitals was asked to indicate the average waiting time to receive CT and MRI scans for urgent and elective stroke patients. Since the on-site availability of scanning technology may influence waiting times, responses were stratified by whether hospitals actually had a scanning machine. As shown in Table 8, there were marked discrepancies in access to CT scans for urgent stroke patients (median wait of 2 hours at hospitals with a scan vs. 12 hours at hospitals without a scan) and elective stroke patients (median wait of 2 days at hospitals with a scan vs. 6 days at hospitals

without a scan). Average wait times for urgent and elective MRI scans were more closely distributed between institutions having and those not having the technology (Table 9). These results suggest a need for evidence-based guidelines to be developed with regard to the appropriate indications and maximum acceptable waiting times for urgent and elective CT and MRI scans of acute stroke patients in Ontario. Strategies should also be developed to reduce inequities in access to imaging technology between centres with and without scanners.

Table 8: Distribution of the average waiting time for urgent and elective CT scans at acute hospitals with and without scanners in Ontario, 1997/98

	URGENT PATIENTS (WAITING TIME IN HOURS)		ELECTIVE PATIENTS (WAITING TIME IN DAYS)	
	HOSPITALS WITH CT (n=57)	HOSPITALS WITHOUT CT (n=77)	HOSPITALS WITH CT (n=53)	HOSPITALS WITHOUT CT (n=75)
	25 Percentile	1	4	1
Median	2	12	2	6
75 Percentile	4	24	5	14
Range	1-48	1-100	1-60	1-270

n hospitals with CT Scans = 59
n hospitals without CT Scans = 81

Table 9: Distribution of the average waiting time for urgent and elective MRI scans at acute hospitals with and without scanners in Ontario, 1997/98

	URGENT PATIENTS (WAITING TIME IN HOURS)		ELECTIVE PATIENTS (WAITING TIME IN DAYS)	
	HOSPITALS WITH MRI (n=20)	HOSPITALS WITHOUT MRI (n=55)	HOSPITALS WITH MRI (n=20)	HOSPITALS WITHOUT MRI (n=55)
	25 Percentile	3	7	3
Median	12	24	8	14
75 Percentile	24	48	75	90
Range	1-48	2-100	1-300	2-365

n hospitals with MRI Scans = 22
n hospitals without MRI Scans = 118

Tissue-Plasminogen Activator for acute stroke

The recent National Institute of Neurological Disorders and Stroke (NINDS) trial indicated that the thrombolytic agent rtPA is a potentially valuable treatment option for acute stroke patients.² Although use of rtPA for the treatment of stroke has not yet been approved by the Health Protection Branch of Health Canada, a number of questions were asked in order to determine the readiness of Ontario hospitals to administer rtPA for this purpose. Thirty-two per cent of hospitals reported that a neurologist is on-call 24 hours to their emergency room while 24% indicated that a protocol for the emergency room management of stroke patients has been developed. These numbers will need to be increased if rtPA is to be made more widely available in Ontario.

An important issue with rtPA is the extent to which CT scans of the head can be rapidly performed for acute stroke patients. Hospitals with CT scanners were asked to report the shortest length of time, in minutes, required to complete an emergency scan of an acute stroke patient. The median response was 30 minutes with a reported range of 5 to 120 minutes, which suggests that most hospitals can perform CT scans fairly quickly when required (Table 10). A CT technician was reported as being available in-house 24 hours a day at 68% of these hospitals while a radiologist was available on-call to read a scan 24 hours a day at 90% of the hospitals with a CT scanner. Twenty-two hospitals (16%) reported that they were currently using rtPA to treat stroke patients with an additional 16 (11%) indicating they plan to offer it within the next 12 months. If thrombolytic therapy is formally approved for use in Canada, clinical guidelines regarding the appropriate indications for use will need to be formulated. Guidelines will also need to be developed regarding criteria for determining which centres in the province should be providing rtPA therapy to stroke patients.

Table 10: Distribution of the shortest possible time in minutes between the request for an emergency CT scan and its completion at acute hospital sites in Ontario, 1997/98

	TIME BETWEEN CT REQUEST AND COMPLETION (n=57) (minutes)
25 Percentile	15
Median	30
75 Percentile	60
Range	5-120

Table 11: Proportion of acute hospitals with facilities to perform various diagnostic tests in Ontario, 1997/98

DIAGNOSTIC TEST	HOSPITALS WITH FACILITIES*
Transthoracic Echocardiography	74 (55%)
Transesophageal Echocardiography	37 (28%)
Holter Monitoring	124 (91%)
Carotid Doppler	94 (69%)
Cerebral Angiography	31 (23%)
Transcranial Doppler	16 (12%)
EEG	74 (55%)
SPECT (Brain) Scan	44 (33%)

* Percentages are based on the number of hospitals that answered the question. The number of hospitals that did not respond varied from 4 - 9 depending on the diagnostic test queried on.

Other diagnostic tests for stroke patients

A variety of diagnostic tests, in addition to CT and MRI imaging, are also useful in the evaluation of acute stroke patients. These tests include transthoracic and transesophageal echocardiography, Holter monitoring, carotid dopplers, cerebral angiography, transcranial dopplers, EEGs, and SPECT brain scans. Acute care hospitals were asked to report the availability of these diagnostics at their respective facilities. As shown in Table 11, there were wide variations in the availability of such tests with 16 hospitals (12%) having transcranial doppler facilities and 124 hospitals (91%) providing Holter monitoring. These results suggest that evidence-based guidelines regarding the appropriate indications for the provision of various types of diagnostic tests in the management of acute stroke should be developed. Chart audits should be conducted to determine the frequency of use of these tests in centres with and without the testing facilities to assess whether variation in access affects patient outcomes.

Waiting time for transfer to other types of facilities

Many stroke patients have significant disability following their stroke which requires transfer either to a rehabilitation hospital, a chronic care hospital, or a long-term care institution. Hospitals were asked to record the average waiting time for stroke patients to be transferred to these different types of institutions (Table 12). The median waiting time for transfer to another facility from an acute hospital setting ranged from 14 days for transfer to a rehabilitation hospital, 24 days to chronic care, and 45 days for transfer to long-term care institutions. A median wait of 2 weeks for transfer to an

Table 12: Distribution of the average waiting time for transfer to another facility from an acute hospital setting in Ontario, 1997/98

	AVERAGE WAITING TIME (DAYS)		
	REHABILITATION HOSPITAL (n=124)	CHRONIC CARE HOSPITAL (n=90)	LONG-TERM CARE (n=116)
25 Percentile	8	7	16
Median	14	24	45
75 Percentile	30	120	113
Range	1-135	1-365	1-365

acute rehabilitation hospital may be excessive, given that patients referred to rehabilitation specialty institutions are generally those individuals with mild to moderate disability who might benefit from prompt access to an intensive stroke rehabilitation program.

Regional linkages and transfer protocols

One of the objectives of this survey was to gather information on referral patterns between different types of institutions within a given region. Although these referral patterns will be analyzed in more detail at a later date, it was noted that there were relatively few institutions that had formal patient transfer agreements with other sites. Of the acute care hospitals, 10% had one or more transfer agreements with other acute hospitals, 11% with rehabilitation hospitals, and 9% with chronic care institutions. These and earlier results suggest a need for a better coordinated stroke program at the regional level so that more timely transfers between institutions may occur.

Outpatient programs for stroke patients

In the survey, several questions were included to gather information on the range and types of programs available to stroke patients at hospitals in Ontario, both at the individual hospital level and within the community. The most frequently reported outpatient program was a general rehabilitation clinic which was present at 27% of acute and 35% of rehabilitation/chronic care hospitals (Table 13a). Dedicated stroke prevention and stroke rehabilitation clinics were found in only 6% and 9% of acute hospitals respectively, and at 0% and 24% of rehabilitation/chronic care institutions. Almost three-quarters of rehabilitation/chronic care institutions reported some combination of other available programs such as a geriatric day hospital and adult day care programs. It should be noted that at 62

of the responding acute hospitals, no outpatient stroke program of any type was provided. At the community level (as reported by hospitals), there was a greater availability of stroke programs and many unique types of programs such as aphasia centres (Table 13b). Eleven per cent of acute and none of the rehabilitation/chronic care hospitals reported that stroke rehabilitation programs were unavailable in their community.

Table 13a: Proportion of acute and rehabilitation/chronic care hospitals providing outpatient stroke programs in Ontario, 1997/98

OUTPATIENT PROGRAM	ACUTE SITES* (n=140)	REHAB/CHRONIC CARE SITES* (n=17)
Stroke Prevention Clinic	8 (6%)	—
Stroke Rehabilitation Clinic	12 (9%)	4 (24%)
General Rehabilitation Clinic	38 (27%)	6 (35%)
Stroke Follow-up Clinic	13 (9%)	6 (35%)
Other**	41 (29%)	12 (71%)
No Outpatient Stroke Programs	62 (44%)	2 (12%)

* May not add to 100 as some hospitals provide more than one outpatient program.

** For example, the *Living with Stroke* program; stroke support and recovery groups; and geriatric day programs.

Table 13b: Proportion of acute and rehabilitation/chronic care hospitals indicating the availability of stroke programs in their community in Ontario, 1997/98

COMMUNITY PROGRAM	ACUTE SITES* (n=140)	REHAB/CHRONIC CARE SITES* (n=17)
Stroke Prevention Clinic	7 (5%)	3 (18%)
Stroke Rehabilitation Clinic (<i>at another hospital</i>)	48 (34%)	7 (41%)
General Rehabilitation Clinic (<i>at another hospital</i>)	53 (38%)	11 (65%)
Stroke Rehabilitation Clinic (<i>Private</i>)	8 (6%)	6 (35%)
General Rehabilitation Clinic (<i>Private</i>)	45 (32%)	11 (65%)
Rehabilitation through Home Care	115 (82%)	17 (100%)
Other**	42 (30%)	7 (41%)
No Community Stroke Programs	15 (11%)	—

* May not add to 100 as some hospitals reported that their community provides more than one stroke program.

** For example, Aphasia Centre; respite day programmes; stroke recovery and support groups.

Information for stroke patients

Many stroke patients and their families have highlighted the importance of having information about all aspects of stroke to assist in their understanding and recovery from the disease. Hospitals were asked whether they routinely provided written information on various aspects of stroke to patients at their hospitals. As shown in Table 14, approximately half of the hospitals responded affirmatively. Hospitals should be encouraged to work with their local chapter of the Heart and Stroke Foundation to ensure that patients are given information aids developed specifically for stroke.

Support groups

The availability of support groups for patients and their families was also determined in the survey. Thirteen per cent of acute hospitals reported having a support group for stroke patients on-site as compared to 56% of the hospitals reporting the availability of a support group in their community.

Continuing stroke education

Continuing education for health care professionals treating stroke patients is also important given recent advances in the field. Of the responding hospitals, 44% provided stroke-related continuing clinical education for physicians, while 59% and 53% of acute hospitals offered such education to nurses and rehabilitation personnel, respectively.

Table 14: Proportion of acute hospitals routinely providing written information to stroke patients and/or their families in Ontario, 1997/98

TOPIC	HOSPITALS PROVIDING INFORMATION (n=140)
Stroke Prevention	65 (46%)
Stroke Rehabilitation	77 (55%)
Dealing with Stroke	88 (63%)
Stroke Treatment	71 (51%)
Other*	29 (21%)

* For example, caregiver support; drug information; patient pathway.

DISCUSSION

Stroke is a complex and devastating disease that presents an enormous burden to patients, their families and the Canadian health care system. Effective care requires that a wide range of health care providers and institutions work together. In this inventory of stroke care in Ontario hospitals, a substantial amount of baseline information was gathered. These data will help to inform plans for improving stroke care in Ontario.

As the survey data are primarily descriptive, definitive conclusions about the quality of stroke care cannot be made. However, the data do show wide variations in access to rehabilitation services and diagnostic tests provided at Ontario hospitals. While patients at some hospitals have good access to the full range of acute stroke care treatments, patients at other hospitals face considerable delays to receiving beneficial stroke care services. These differences underscore the need for a coordinated stroke care program so that patients in all regions of Ontario have equitable access to stroke-related services.

Variations identified in this report, for example waiting times for rehabilitation services or use of thrombolytics, argue for the development of evidence-based guidelines and standards covering the spectrum of stroke care in Ontario. It is expected that these guidelines would be widely disseminated to health care providers throughout the province as part of a coordinated strategy. In addition, the maximum acceptable waiting times for various stroke-related tests and rehabilitation therapy need to be established, and strategies developed to ensure that all patients receive these services within recommended time frames.

Concurrent with the development of guidelines for care, regional and/or provincial meetings should be held with front-line health care providers, stroke researchers, and health care administrators to identify the most pressing quality-of-care problems affecting stroke patients in different regions of Ontario so that high-priority issues can be addressed. The selective establishment of prospective stroke registries and/or retrospective stroke patient chart audits is also recommended to enable a better understanding of the stroke care delivery process. Furthermore, by way of informing the coordinated stroke strategy process, an in-depth analysis of Ontario stroke data in the Canadian Institute for Health Information (CIHI) database should be undertaken to evaluate population-based trends and regional variations in stroke admission rates, resource utilization, and patient outcomes.

It is anticipated that the information in this report will be useful to the hospitals who participated in the survey and to all stroke care providers in Ontario. The waiting time results, presented in terms of provincial distributions, can be used by individual hospitals to compare their management of stroke patients to the stroke care provided at other hospitals in Ontario. At institutions where patients have relatively poorer access to stroke related services, providers and administrators should consider using the findings from this survey as benchmarks when developing strategies to improve the level of stroke care provided.

References

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2. Tissue plasminogen activator for acute ischemic stroke. The National Institute of Neurological Disorders and Stroke rtPA Stroke Study Group. *N Engl J Med* 1995;333:1581-1587.
3. Stroke Unit Trialists' Collaboration. Collaborative systematic review of the randomised trials of organized inpatient (stroke unit) care after stroke. Stroke Unit Trialists' Collaboration. *BMJ* 1997;314:1151-1159.

APPENDIX

Survey Respondents

Ajax and Pickering General Hospital
Alexandra Hospital (Ingersoll)
Alexandra Marine and General Hospital (Goderich)
Almonte General Hospital
Baycrest Centre for Geriatric Care (North York)
Belleville General Hospital
Brantford General Hospital
Brockville General Hospital
Bruce Peninsula Health Services (Wiarton)
Cambridge Memorial Hospital
Campbellford Memorial Hospital
Carleton Place and District Memorial Hospital
Centenary Health Centre (Scarborough)
Centre Grey General Hospital (Markdale)
Chesley and District Memorial Hospital
Clinton Public Hospital
Collingwood General and Marine Hospital
Cornwall General Hospital
County of Bruce General Hospital (Walkerton)
Deep River and District Hospital
Douglas Memorial Hospital (Fort Erie)
Dufferin-Caledon Health Care Corporation (Orangeville)
Durham Memorial Hospital
Englehart and District Hospital
Etobicoke General Hospital
Four Counties General Hospital (Newbury)
Georgetown and District Memorial Hospital
Glengarry Memorial Hospital (Alexandria)
Grand River Hospital (Kitchener)
Greater Niagara General Hospital (Niagara Falls)
Grey Bruce Regional Health Centre (Owen Sound)
Groves Memorial Community Hospital (Fergus)
Guelph General Hospital
Haldimand War Memorial Hospital (Dunnville)
Hamilton Health Sciences Corporation
Hanover and District Hospital
Hawkesbury District General Hospital
Hopital Montfort (Ottawa)
Hopital Notre Dame Hospital (Hearst)
Hopital Regional de Sudbury Regional Hospital
Hospital for Sick Children (Toronto)
Hotel Dieu Hospital (St. Catharines)
Hotel Dieu Grace Hospital (Windsor)
Humber River Regional Hospital (Toronto)
Huntsville District Memorial Hospital
James Bay General Hospital (Moosonee)
Joseph Brant Memorial Hospital (Burlington)
Kemptville District Hospital
Kingston General Hospital
Kirkland and District Hospital
Lake of the Woods District Hospital (Kenora)
Lennox and Addington County General Hospital (Napanee)
Listowel Memorial Hospital
London Health Sciences Centre
Louise Marshall Hospital (Mount Forest)
Manitouwadge General Hospital
Markham Stouffville Hospital
Mattawa General Hospital
McCausland Hospital (Terrace Bay)
Meaford General Hospital
Memorial Hospital (Bowmanville)
Mount Sinai Hospital (Toronto)
Niagara-on-the-Lake General Hospital
Nipigon District Memorial Hospital
Norfolk General Hospital (Simcoe)
North Bay General Hospital
North Durham Health Services (Port Perry)
North York Branson Hospital
North York General Hospital
Northumberland Health Corporation (Cobourg)
Orillia Soldiers' Memorial Hospital
Oshawa General Hospital
Ottawa General Hospital
Parkwood Hospital (London)
Peel Memorial Hospital (Brampton)
Pembroke General Hospital
Penetanguishene General Hospital
Peterborough Civic Hospital
Prince Edward County Memorial Hospital (Picton)
Providence Centre (Scarborough)
Providence Continuing Care Centre (Kingston)

APPENDIX

Queensway-Carleton Hospital (Nepean)
Red Lake Margaret Cochener Memorial Hospital
Rehabilitation Institute of Toronto
RHSJ Health Centre of Cornwall
Ross Memorial Hospital (Lindsay)
Royal Victoria Hospital (Barrie)
Salvation Army Toronto Grace
Sarnia General Hospital
Saugeen Memorial Hospital (Southampton)
Sault Area Hospitals
Scarborough General Hospital
Seaforth Community Hospital
Sensenbrenner Hospital (Kapuskasung)
Shaver Hospital (St. Catharines)
Sioux Lookout District Health Centre
Sisters of Charity of Ottawa Health Services
Smooth Rock Falls Hospital
South Bruce Grey Health Centre (Kincardine)
South Huron Hospital Association (Exeter)
South Muskoka Memorial Hospital (Bracebridge)
St. Catharines General Hospital
St. Francis Memorial Hospital (Barry's Bay)
St. John's Rehabilitation Hospital (Willowdale)
St. Joseph's Care Group (Thunder Bay)
St. Joseph's General Hospital (Elliot Lake)
St. Joseph's Health Centre of London
St. Joseph's Health Centre (Toronto)
St. Joseph's Hospital (Chatham)
St. Joseph's Hospital (Hamilton)
St. Joseph's Hospital (Brantford)
St. Mary's General Hospital (Kitchener)
St. Mary's Memorial Hospital (St. Mary's)
St. Michael's Hospital (Toronto)
St. Peter's Hospital (Hamilton)
St. Thomas Elgin General Hospital
Stevenson Memorial Hospital (Alliston)
Stratford General Hospital
Strathroy-Middlesex General Hospital
Sunnybrook Health Science Centre (North York)
Sydenham District Hospital (Wallaceberg)
Temiskaming Hospital (New Liskeard)
The Arnprior and District Memorial Hospital
The Credit Valley Hospital (Mississauga)
The Lady Minto Hospital (Cochrane)
The Mississauga Hospital
The Public General Hospital Society of Chatham
The Salvation Army Scarborough Grace
The Toronto Hospital
Tillsonburg District Memorial Hospital
Timmins and District Hospital
Toronto East General and Orthopedic Hospital
Trenton Memorial Hospital
Welland County General Hospital
Wellesley-Central Hospital (Toronto)
West Park Hospital (Toronto)
West Haldimand General Hospital (Hagersville)
West Lincoln Memorial Hospital (Grimsby)
Whitby General Hospital
Willett Hospital (Paris)
Wilson Memorial General Hospital (Marathon)
Windsor Regional Hospital
Wingham and District Hospital
Woodstock General Hospital
York Central Hospital (Richmond Hill)
York County Hospital (Newmarket)

SURVEY HIGHLIGHTS

- 34 acute hospitals have developed a stroke care map while 50 sites are currently developing one
- 24% of acute hospitals have an emergency room stroke protocol
- 4% of acute hospitals have dedicated stroke units
- Family physicians play a leading role in stroke management
- Neurologists are the attending physician for stroke patients at 12% of acute hospitals
- Median inpatient waiting time of 2 days to be seen by stroke rehabilitation specialist
- Median wait of 7-11 days for outpatient stroke and home care rehabilitation specialist services
- 2-hour wait for urgent CT scan of head at hospitals with scanner vs. 12- hours at hospitals without
- 22 hospitals currently administer thrombolytics while 16 sites plan to in the next year
- Median wait of 14 days for transfer of acute stroke patients to a rehabilitation hospital and 45 days for transfer to a long-term care institution
- Half of acute hospitals provide written stroke information to patients and their families

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