



Canadian Stroke Network  
Réseau Canadien contre  
les accidents cérébrovasculaires

# Canadian Stroke Network

## Stroke Services and Resource Inventory

*A National Survey Initiative*

**Final Report**

**June 2007**

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## 1.0 Background and Objectives

Stroke is the leading cause of adult neurological disability in Canada. Currently, more than 50,000 Canadians per year suffer a stroke and over 300,000 Canadians live with its ongoing effects. Over the next ten years, the incidence and prevalence of strokes are predicted to grow because of the aging population.

In 2003, stroke stakeholders and experts unanimously agreed that Canada was ready for an integrated stroke strategy modeled on the successes and lessons learned from the Ontario Stroke System and other strategies, but tailored to meet the unique needs of individual provinces and territories. A recent economic analysis conducted by the Canadian Stroke Network (CSN) projects that over 20 years, such an integrated strategy could prevent 160,000 strokes and achieve a net savings of \$8 billion for the health care system.

Under the leadership of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada (HSFC), the Canadian Stroke Strategy (CSS) was developed. The vision is that all Canadian will have optimal access to integrated, high quality, and efficient services in stroke prevention, treatment, rehabilitation, recovery and community reintegration. At a national level, public awareness campaigns, best practice synthesis, professional development initiatives, and an evaluation framework will help support regional efforts to implement best practices.

Participants in the Canadian Stroke Strategy have identified a need for an accurate picture of the state of stroke care in Canada. For this reason, the CSN, in cooperation with the HSFC and the Canadian Stroke Consortium, undertook a survey of Canadian health institutions over the period of June-August 2006. The purpose was to gather baseline information on stroke care. Over time, the goal is to measure improvement in these services. This report provides an overview of the survey results.

## 2.0 Approach and Methodology

A professional marketing company, The Antima Group, was contracted to manage the survey process and conduct the survey on behalf of the Canadian Stroke Network. The Antima Group worked closely with members of the Canadian Stroke Network throughout the survey process.

An email-Web survey was chosen as the most appropriate data collection approach to conduct the Stroke Services and Resource Inventory (SSRI). The following five reasons outline the rationale for the implementation of this approach:

- the nature of the information collected is such that respondents would likely need to gather information prior to completion of the survey, as opposed to attitudinal information which can be answered quickly without preparation;
- an on-line approach allows respondents to complete the survey at their convenience;
- the approach allows for partial completion and forwarding (electronically) between multiple respondents within the same facility;
- data compilation and analysis is most efficient using this method; and,
- it is the most cost effective approach.

## 2.1 Sampling

In order for the SSRI to be successful, the Canadian Stroke Network and its partners needed to develop a reliable “sample frame”, in other words, a complete and reliable list of facilities that contained the names and contact information for all acute care hospitals and designated inpatient rehabilitation facilities in Canada.

The sample, including both organization names and key contact persons, was drawn from a variety of sources with the goal of including all possible organizations and identifying the best possible persons to provide information about the stroke services available within an institution. The target population for this survey included all acute care hospitals and designated inpatient rehabilitation facilities in Canada. A database purchased from the Canadian Healthcare Association formed the basis of the sample. Institutions that were long-term care facilities or other specialized non-acute facilities (e.g., mental health facilities) were excluded.

The database provided contact information, usually the Chief Executive Officer or Chief Operating Officer of the hospital. The contact list was further refined by cross-referencing Canadian Stroke Consortium members with the institutions listed to ensure the most appropriate person received the survey in each institution. Representatives of provincial Heart and Stroke Foundations also assisted in identifying the appropriate individuals within each region. In all cases, the survey cover letter instructed respondents to forward the survey to the most appropriate persons to provide stroke-related information within each institution.

The final potential participant list consisted of 580 unique facilities. Given the size of the final sample data list, a **census**<sup>1</sup> of stroke care facilities was conducted rather than extracting a representative sample. An invitation to participate in the survey was sent to every organization on the final sample list.

## 2.2 Questionnaire Design

The survey questionnaire was developed with substantial input from stakeholders and was designed to complement as well as add to existing stroke care research that has been conducted within Canada over the past five years at both the national and provincial levels. The design of the survey questionnaire included the following steps: a literature review of previous studies; the creation of a draft survey questionnaire; a consultation process with key stakeholders; and the creation of the final survey questionnaire.

### Literature Review

In an effort to gain a better understanding of the important issues related to the provision of Stroke care, a literature review of previous surveys and reports was conducted. In total, eighteen (18) survey instruments were reviewed in addition to five (5) written reports related to stroke care in Canada. In the course of this review, questions were isolated that appeared consistently throughout the documents, as well as identifying those questions that had not yet been asked of stroke care facilities in Canada and were deemed relevant to the intended purpose of this survey. Upon completion of the literature review a list of potential survey questions was drafted.

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<sup>1</sup> A census refers to the method of obtaining information about every member of a population. For this survey every facility in the database was invited to participate.

### Draft Questionnaire/Consultation Process

An initial questionnaire strategy session was conducted between the Antima Group and Canadian Stroke Network. The purpose of the session was two-fold:

1. identify those questions from the list of potential research questions to be included in the first draft of the questionnaire; and,
2. identify additional questions to be considered.

Based on the input and direction received during the strategy session, a questionnaire was drafted and submitted to the participants of the strategy session for comments and feedback. Upon receipt of comments the questionnaire was redrafted and sent to the Chairs of the Canadian Stroke Strategy National Platform Working groups. A series of conference calls were then conducted with the Chairs of the National Platform Working groups. The purpose of the first two calls was to engage these important stroke care representatives and to obtain their input to the draft questionnaire, and the last call was conducted to get final approval of the questionnaire from the stakeholders. The stakeholders were also given the opportunity to provide their comments and suggestions in writing. The draft survey instrument was then reviewed by other key stakeholders' country-wide to further validate the content of the questionnaire.

The final version of the questionnaire (see Appendix One) consisted of seven sections and 63 questions, most of which were closed-ended and inventory style questions. The questionnaire was translated to French, allowing all facilities the option of completing the survey in their language of choice. The final English and French versions of the questionnaire were programmed into a web-based survey data collection system, and then pre-tested extensively for clarity, flow, and ease of use, as well as to ensure survey respondents did not encounter technical difficulties while online. Privacy and confidentiality issues were addressed to ensure compliance with current privacy of information legislation.

### ***Communicating the Survey to the Target Population***

In order to maximize the number of facilities which would participate in the SSRI survey, a pre-communications strategy was developed. Each identified contact person from the final participant list was sent an email in advance of the survey launch describing the purpose and timing of the study.

The pre-communication letter describing the purpose of the study and the importance of the Canadian Stroke Strategy was drafted, and forwarded to each provincial Canadian Stroke Strategy representative to enable the CEO of the provincial Heart and Stroke Foundations to provide their signature in an attempt to achieve further "buy in" from the stroke care facilities in their respective provinces. A sample letter can be found in Appendix Two.

### ***Data collection***

The data collection process was divided into two streams. Two provinces (Nova Scotia and Prince Edward Island) had recently conducted a similar survey and chose to submit the data centrally rather than resurveying potential participating organizations in their provinces. Where gaps in the information existed which had not been collected in the original provincial survey, the

provincial Stroke Strategy representative obtained the required information directly from the appropriate participants. These two provinces were provided with a data collection tool in Excel format to fill in the appropriate data per facility within their respective province to facilitate final analysis. All sites that participated in the original survey were sent a letter notifying them of the current study and requesting permission to share their previous data. All sites agreed to have their information included in the present national survey.

For the remaining provinces, the electronic survey was conducted over a three month period beginning on June 1, 2006 and ending on August 10, 2006. The identified contact person at all potentially participating stroke care facilities were sent a bilingual email invitation requesting their participation in the survey (Appendix Three). Contained within the email was a unique hyperlink connecting the participants directly to the Internet website hosting the survey. A unique link for each facility was used to ensure the privacy of their data. In other words, only respondents from a specific facility were able to log onto their survey to input information. At many facilities, more than one respondent logged into the web-site to contribute information from their facility. Over the course of the survey period, reminder emails were sent on June 14 and July 4 to those facilities that had not yet completed the survey. Facility lists were also provided to the Heart and Stroke Foundation offices in each province in a further attempt to maximize response rates.

## **2.5 Analysis and Reporting**

All of the responses from the survey have been compiled and analysed using the software, Statistical Package for the Social Sciences (SPSS). Key variables that have been used to organize responses for data analysis and reporting include: province; type of facility; and whether or not the facility has a dedicated stroke unit.

## **2.6 Limitations**

This survey was developed with input from many stakeholders. As with any survey, it may not have covered the full range of content that would help inform the state of stroke resources in Canada. The original sample frame was developed based on a purchased list from the Canadian Healthcare Association, and supplemented with input from individual provinces. Some healthcare facilities may have been unintentionally excluded from the sample frame and therefore not given the opportunity to participate. It is not possible to know whether their participation would have altered the results obtained. Lastly, the response rate for this survey was 35% which is a strong result. At the same time, it represents only one-third of healthcare facilities in the sample frame. It is not possible to know whether full participation would have altered the results obtained. Within each province the response rate varies from 0% to 100%. In provinces with low response rates, the results would not be generalizable at the provincial or regional level.

## 3.0 Results

### 3.1 Response Rate

The final potential participant list included 580 unique facilities that were all sent an invitation to complete the survey. Failed email delivery attempts occurred in 78 facilities, therefore 502 facilities remained as valid potential respondents in the final sample. This cohort formed the denominator for analysis and calculation of response rates, since the undelivered facilities did not have the opportunity to respond to the survey.

In total, 173 of the 502 facilities that were invited to participate completed the survey, which corresponds to a response rate of 35%. This response rate is considered acceptable within the research community, especially given the complex nature of the data to be gathered and the fact that in many cases, multiple respondents were called upon to provide input.<sup>2</sup>

The results of this survey are presented in this report as a summary for all of Canada combined. Specific responses for individual provinces are not included in this report, due to lower response rates in some provinces. Table 3.1 described the percentage of all completed surveys received from each province. It should be noted that the provinces of Ontario and Nova Scotia are relatively over-represented in the final sample while Quebec is under-represented. No survey responses were received from the province of New Brunswick.

**Table 3.1: Response Rate by Province**

Province	% of All Facilities Surveyed (n=502)	% of Completed Surveys (n=173)	Response Rate within Province
British Columbia	12.8%	9.3%	25%
Alberta	16.9%	15.6%	32%
Saskatchewan	8.4%	6.4%	26%
Manitoba	12.2%	9.8%	28%
Ontario	25.9%	37.0%	49%
Quebec	10.0%	2.9%	10%
New Brunswick	5.6%	0%	0%
Newfoundland & Labrador	2.6%	2.3%	31%
Nova Scotia	4.6%	13.3%	100%*
Prince Edward Island	1.2%	3.5%	100%*

\* Nova Scotia and Prince Edward Island surveys were completed centrally, and based in part on results of a recent similar survey conducted in those provinces.

More than half (59%) of all respondents represented acute care hospitals with an emergency department and without rehabilitation beds on site, followed by 27% who responded on behalf of acute care hospitals with an emergency department and with onsite rehabilitation beds. Independent rehabilitation facilities accounted for 4% of respondents.

As shown in **Table 3.2** below, nearly half of the respondents (48%) represented small or rural hospitals while an additional one-third (33%) responded on behalf of a community hospital.

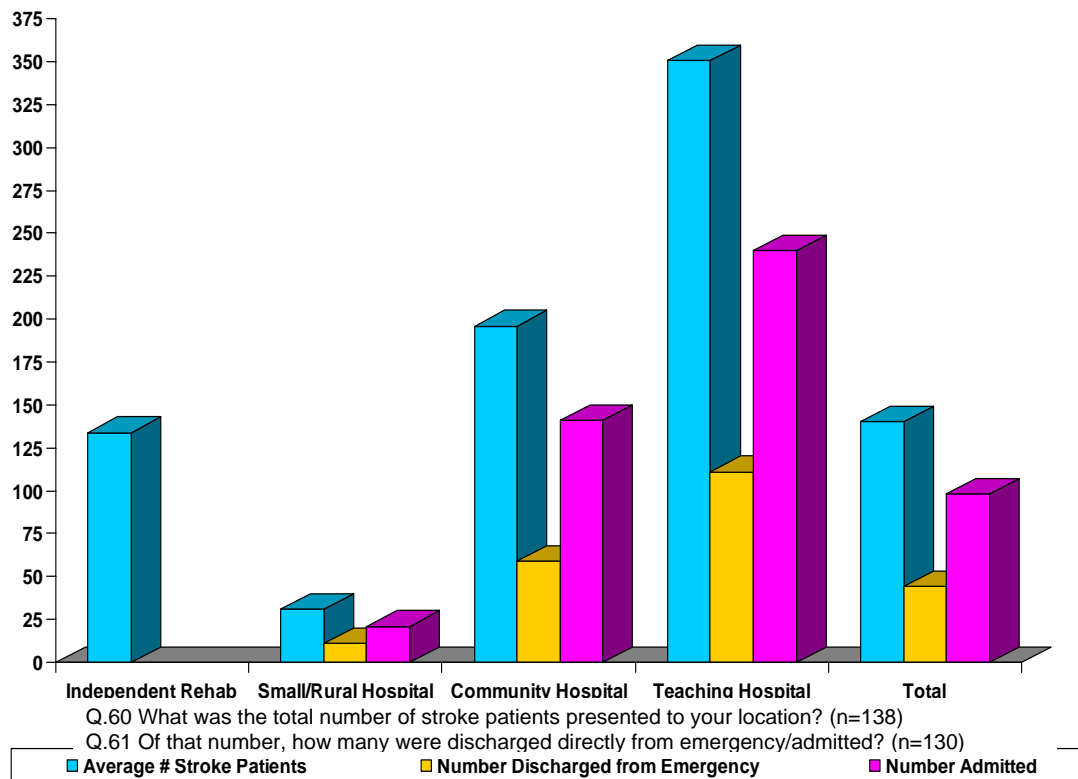
<sup>2</sup> A standard response rate for a survey of this type would be approximately 20-25%.

**Table 3.2: Type of Facility**

Type of Facility	% of Responses
Small/Rural Hospital	48%
Community Hospital	33%
Teaching Hospital	15%
Independent Rehabilitation Centre	4%
Q.63 Is your institution classified as a...? (n=173)	

Nationally, the average number of stroke patients that sought attention or treatment during 2005 at those facilities surveyed is 140 annually (**Exhibit 3.1**). Of those patients approximately 31% were discharged directly from emergency while the remaining 69% were admitted.

**Exhibit 3.1: Number of Stroke Patients**



### 3.2 Staffing and Programs

#### A. Stroke Programs

Just over one-third (36%) of all respondents stated their facility has a recognized stroke program (**Table 3.3**). Small and rural hospitals (13%) are much less likely to have a recognized stroke program than other types of facilities.

**Table 3.3: Locations with Stroke Programs**

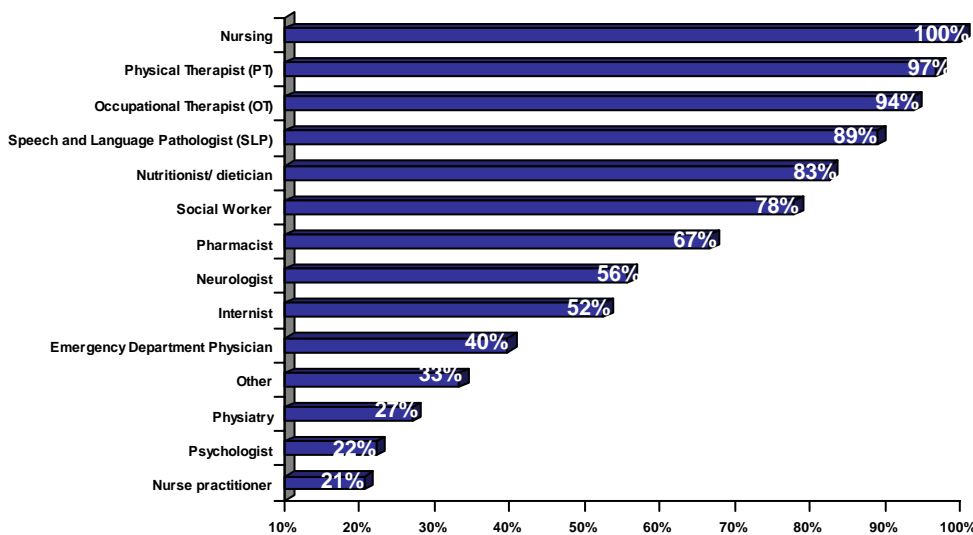
Stroke Program?	Type of Facility				Total
	Teaching Hospital	Community Hospital	Small/Rural Hospital	Independent Rehab Centre	
Yes	61%	51%	13%	6 of 7	36%
No	39%	49%	87%	1 of 7	64%

Q.2 Does your location have a recognized stroke program? (n=172)

- Of those facilities with a recognized stroke program, just over two-thirds (76%) of the programs are provided funding as part of the hospital base budget.
- Approximately 39% of those facilities with a stroke program have a dedicated stroke unit which opened as early as 1974 and as recent as 2006.
- Within these stroke units, 40% of locations treat stroke patients during the acute phase only while an additional 40% treat both acute stroke and rehabilitation patients. The remaining facilities with a stroke unit treat rehabilitation patients only.

#### B. Multi-Disciplinary Stroke Team

About 37% of all facilities surveyed have a multi-disciplinary stroke team and the majority of these facilities (78%) have best practice protocols in place that are used for ischemic and hemorrhagic stroke patients. Of those facilities with a multi-disciplinary stroke team, the teams are made up of the personnel shown in **Exhibit 4.1** below.

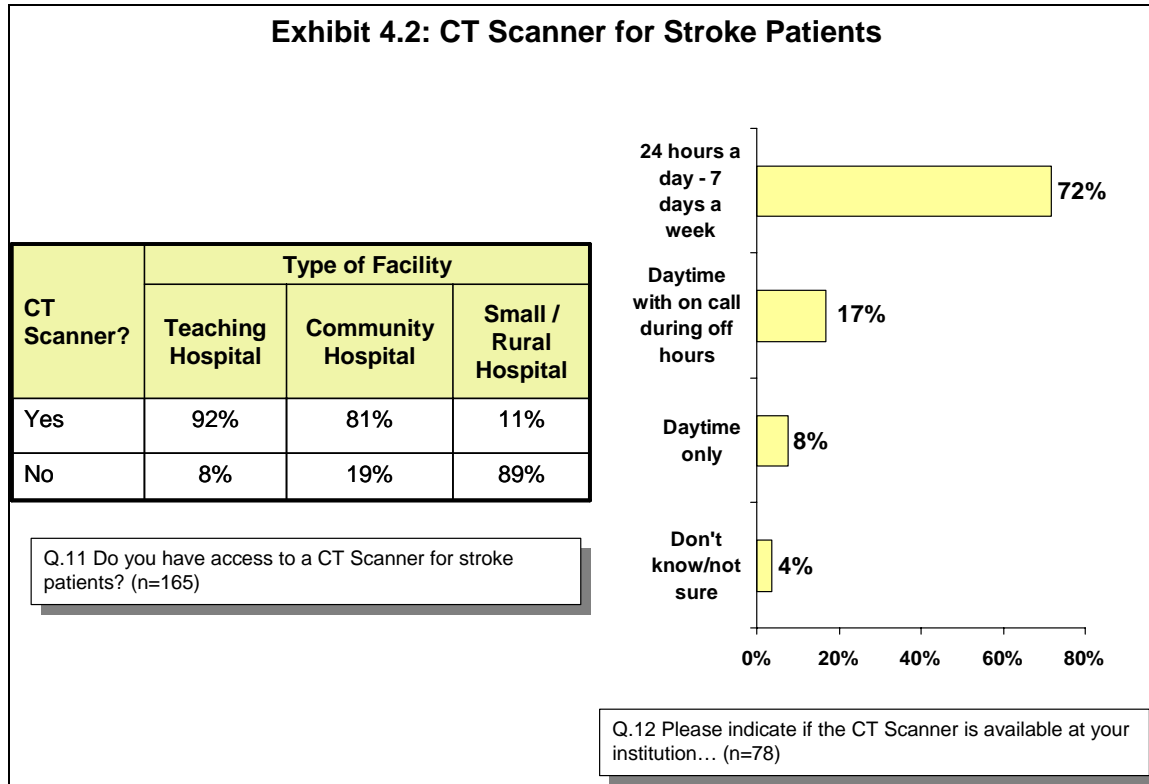


**Exhibit 3.1: Multi-Disciplinary Stroke Team**

### 3.3 Imaging Resources

#### A. CT Scanners for Stroke Patients

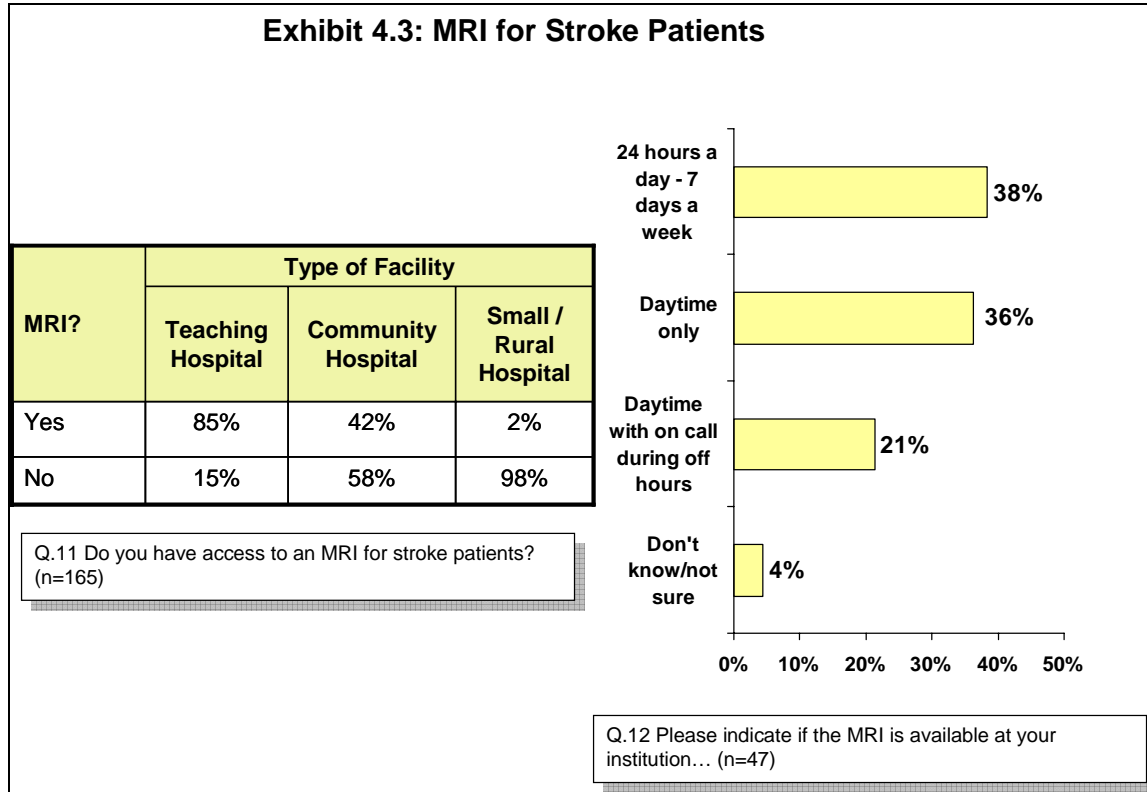
Teaching (92%) and community (81%) hospitals are most likely to have access to a CT scanner for stroke patients. Most facilities that have a CT scanner are able to utilize it 24 hours a day, 7 days a week (72%). An additional 17% of facilities have access during daytime hours with on call access during off hours (Exhibit 3.2).



- More than three-quarters (76%) of facilities with access to a CT scanner accept transfers from other locations for CT scans.
- Nearly all (95%) facilities that do not have access to a CT scanner have an arrangement with another location to get CT scans when needed.
  - The median driving distance to the referable location with a CT scanner is approximately 66 kilometres.

**B. MRI's for Stroke Patients**

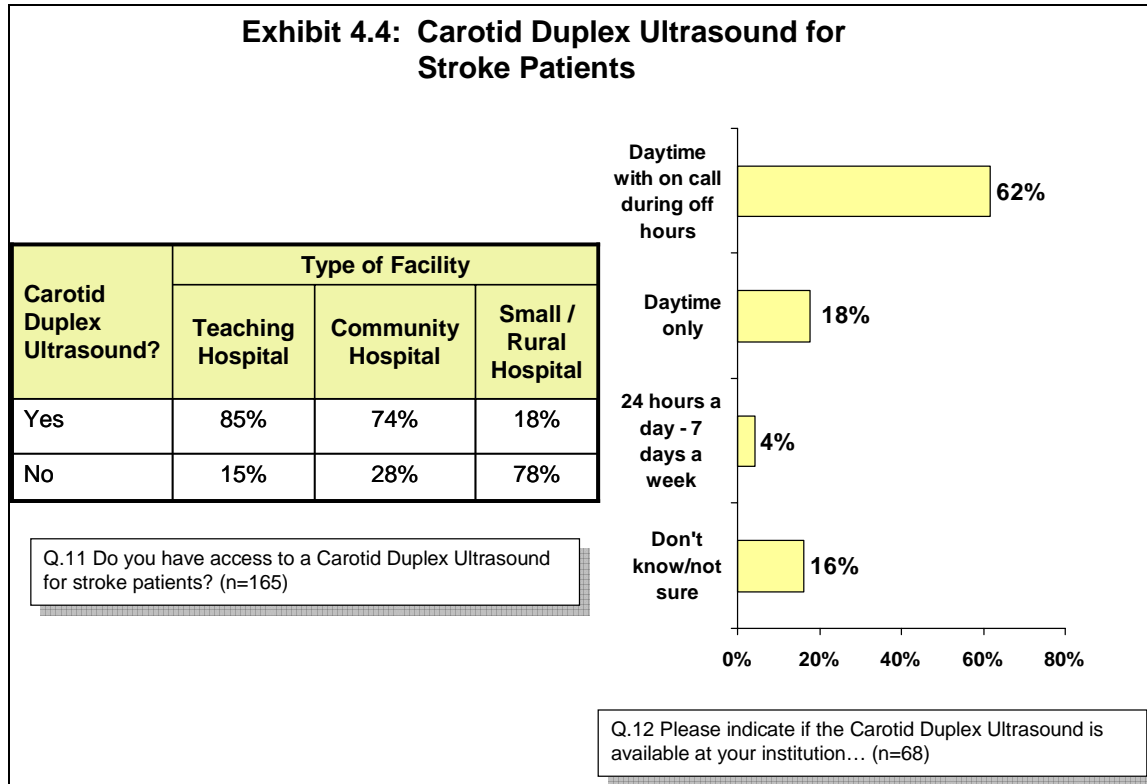
The majority of teaching hospitals (85%) have access to an MRI for stroke patients within their location, as well as 42% of community hospitals. Just over one-third (38%) of those facilities with an MRI have access 24 hours a day, 7 days a week while an additional 36% have access during daytime hours only (Exhibit 3.3).



- More than half (59%) of locations with an MRI accept transfers from other locations.
- The vast majority (86%) of those locations without access to an MRI have an arrangement with another location to get an MRI when needed.
  - The median driving distance to the referable location with an MRI is 100 kilometres.

**C. Carotid Duplex Ultrasounds for Stroke Patients**

Nearly half (47%) of all respondents indicated that their facility has access to a Carotid Duplex Ultrasound for stroke patients within their location. Of those locations with access to a Carotid Duplex Ultrasound, 4% of have access 24 hours a day, 7 days a week (**Exhibit 3.4**).



Protocols for use during imaging of ischemic and hemorrhagic stroke patients have been developed by many facilities and are actively being used. The rates of use of protocols for different imaging studies are presented in Table 3.4.

**Table 3.4: Protocols Available for Use**

Protocols	% of Responses
Ct angiography	81%
CT perfusion	57%
MRI diffusion weighted imaging	60%
MRI perfusion imaging	38%
Transcranial Doppler Ultrasound	24%
Q.13 Which of the following protocols that are used for ischemic and hemorrhagic stroke patients are available at your location? (n=58)	

### 3.4 Telemedicine

As described in **Table 3.5** below, the majority of locations with access to telemedicine technology for stroke patients are utilizing the technology by accessing a neurologist by phone and/or shared computer access to imaging. Less than 25% of sites with telemedicine access use video-conferencing between healthcare professionals or between a healthcare professional and patient.

**Table 3.5: Mode of Telemedicine**

Mode	Type of Facility		
	Teaching Hospital	Community Hospital	Small/Rural Hospital
Access neurologist by phone	86%	87%	87%
Share computer imaging	79%	67%	11%
Share video / live scan	21%	23%	5%
Other	21%	13%	11%
Q.23 What modes of telemedicine do you utilize for stroke patients? (n=82) Base: Those who are able to access stroke experts through telemedicine technology.			

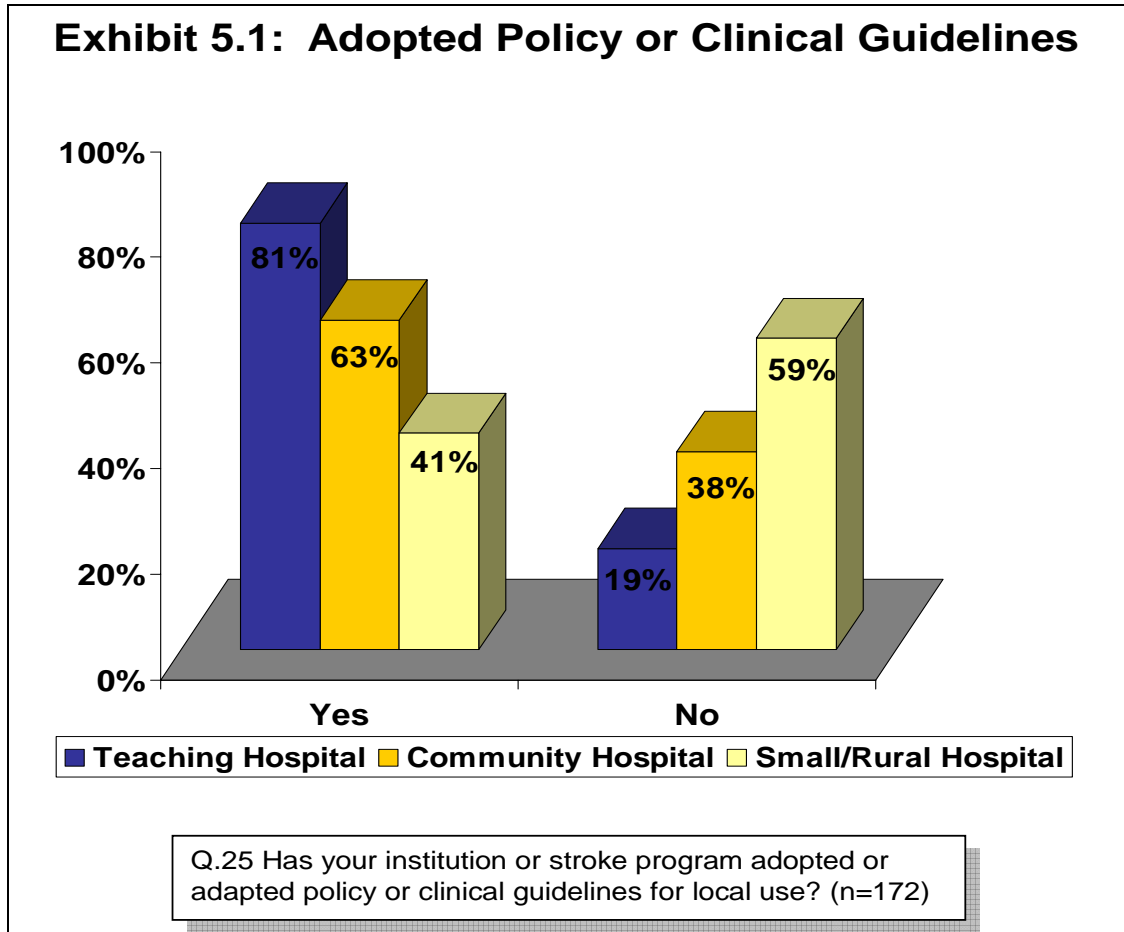
The reason most often identified for the use of telemedicine technology (**Table 3.6**) is for peer-to-peer communications (74%) followed by emergency consults (70%) (i.e. to assess for tPA) and staff education (67%).

**Table 3.6: Reason for use of Telemedicine**

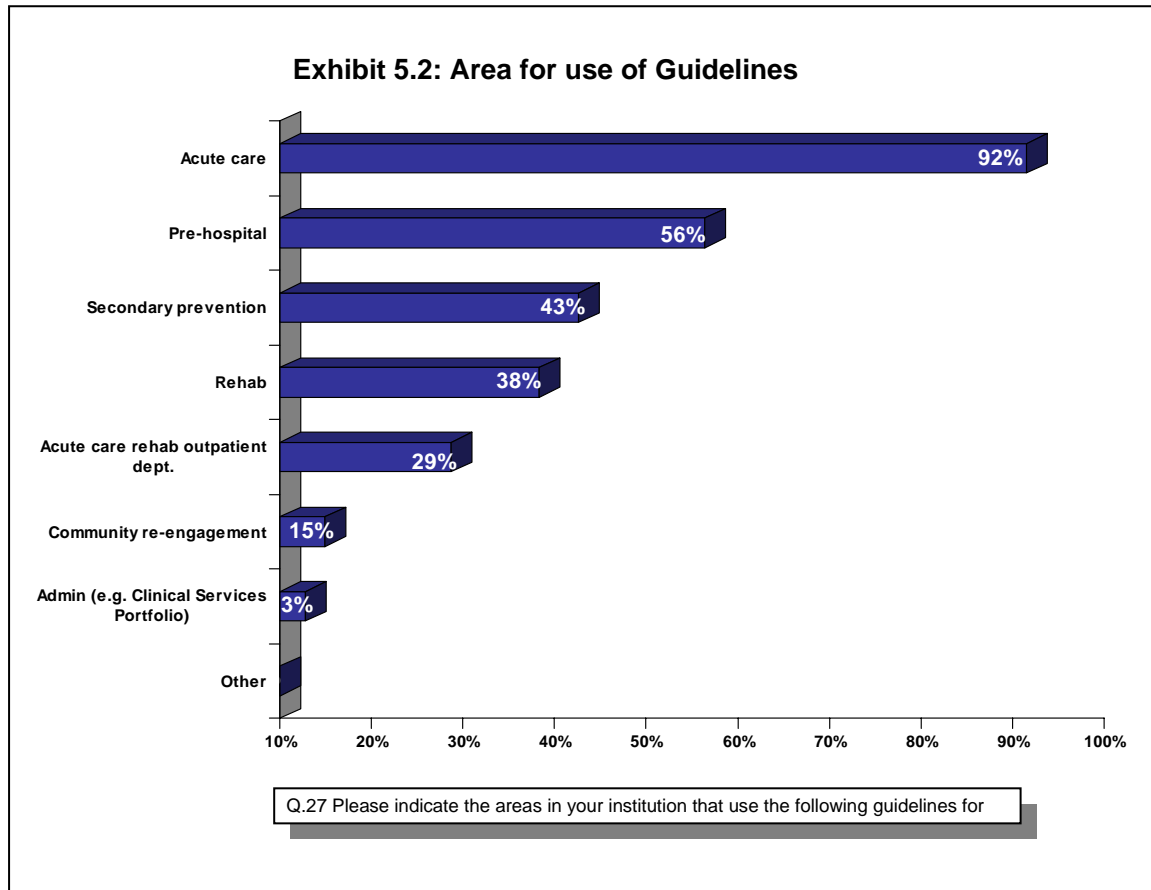
Mode	% of Responses
Peer-to-peer communications	74%
Emergency consults	70%
Staff education	67%
Stroke rehabilitation	33%
Patient education	12%
Other	9%
Q.24 For what components of stroke care does your institution utilize telemedicine technology? (n=82)	

**3.5. Guideline Use**

As shown in **Exhibit 3.5**, most teaching hospitals (81%) have adopted or adapted policy or clinical guidelines for local use as well as almost two-thirds of community hospitals (63%).



Guidelines are most likely to be followed in Acute care (92%) by most institutions involved in stroke care (**Exhibit 3.6**).



The majority of institutions (86%) who have adapted or adopted guidelines for stroke care use the same guidelines regardless of where the patient is located within the institution.

### 3.6. Processes of Care

Most respondents (70%) stated that ambulance personnel use a stroke triage tool while 73% indicated there is a pre-notification protocol from EMS to the emergency department when a stroke patient is in transit.

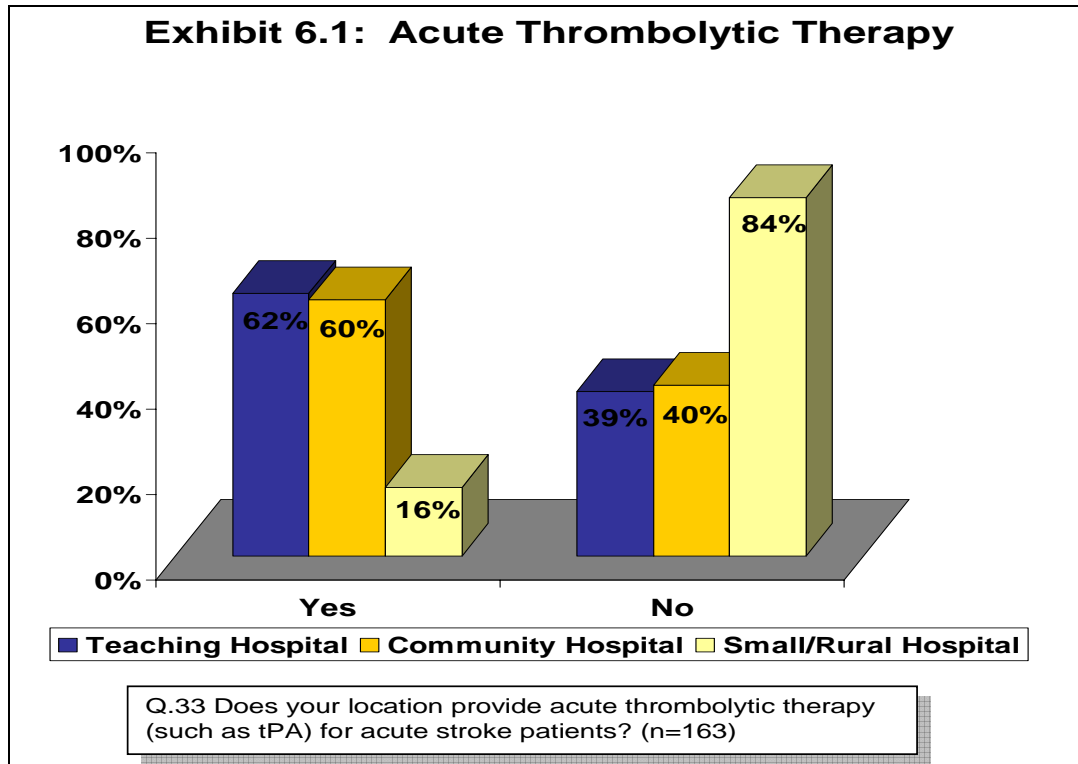
One third of reporting institutions use one or both of the Canadian Neurological Scale (CNS) or the National Institutes of Health Stroke Scale (NIHSS) when conducting a baseline stroke assessment (**Table 3.7**). Small or rural hospitals are somewhat less likely to use the NIHSS than those in other facilities.

**Table 3.7: Baseline Stroke Assessments**

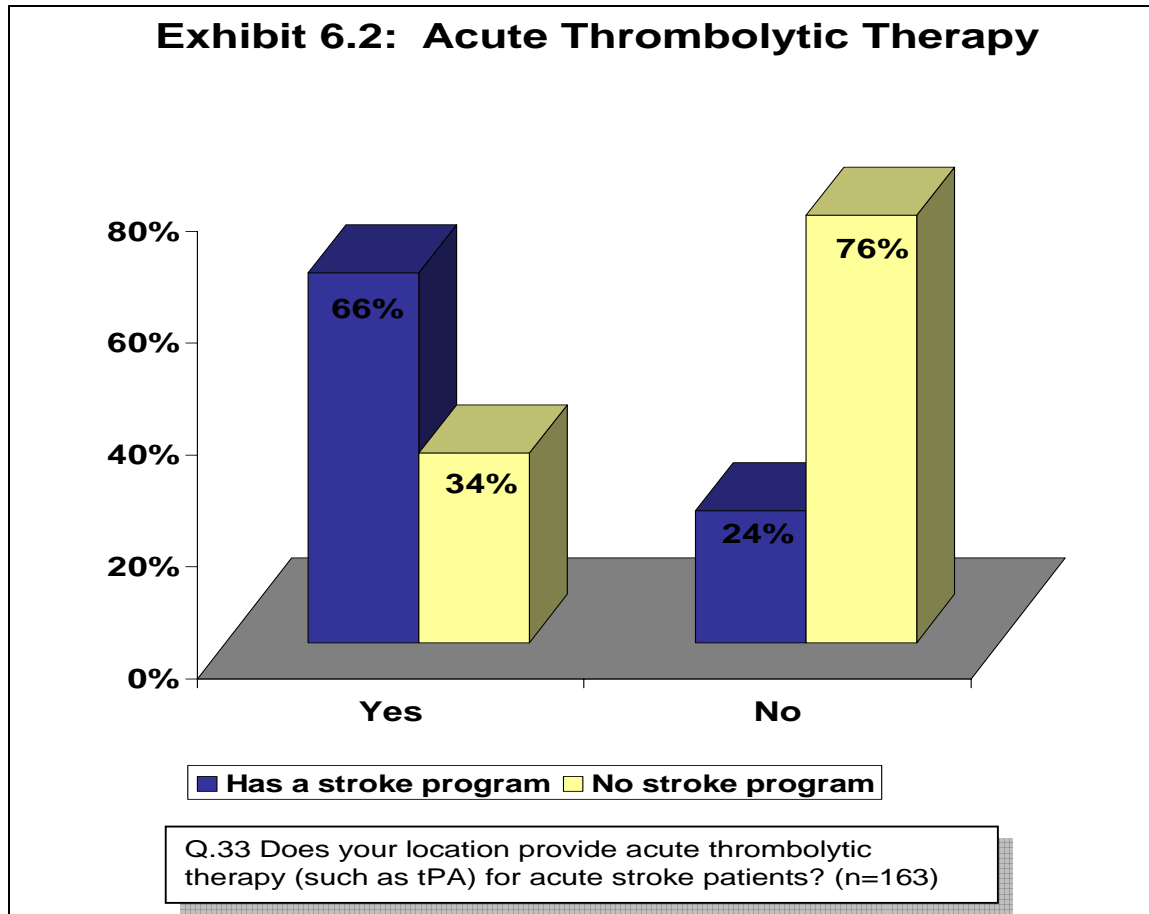
Method	Type of Facility		
	Teaching Hospital	Community Hospital	Small/Rural Hospital
Other	54%	50%	53%
Canadian Neurological Scale (CNS)	33%	33%	41%
National Institutes of Health Stroke Scale (NIHSS)	33%	28%	<b>15%</b>
Q.31 Does your facility conduct baseline stroke assessments using NIHSS or CNS? (n=157)			

Less than half (47%) of those facilities that participated in the survey have a formal protocol for the management of stroke patients in the emergency department, however, nearly all (95%) of the locations providing acute thrombolytic have a formal protocol or procedure for administering acute thrombolysis to stroke patients.

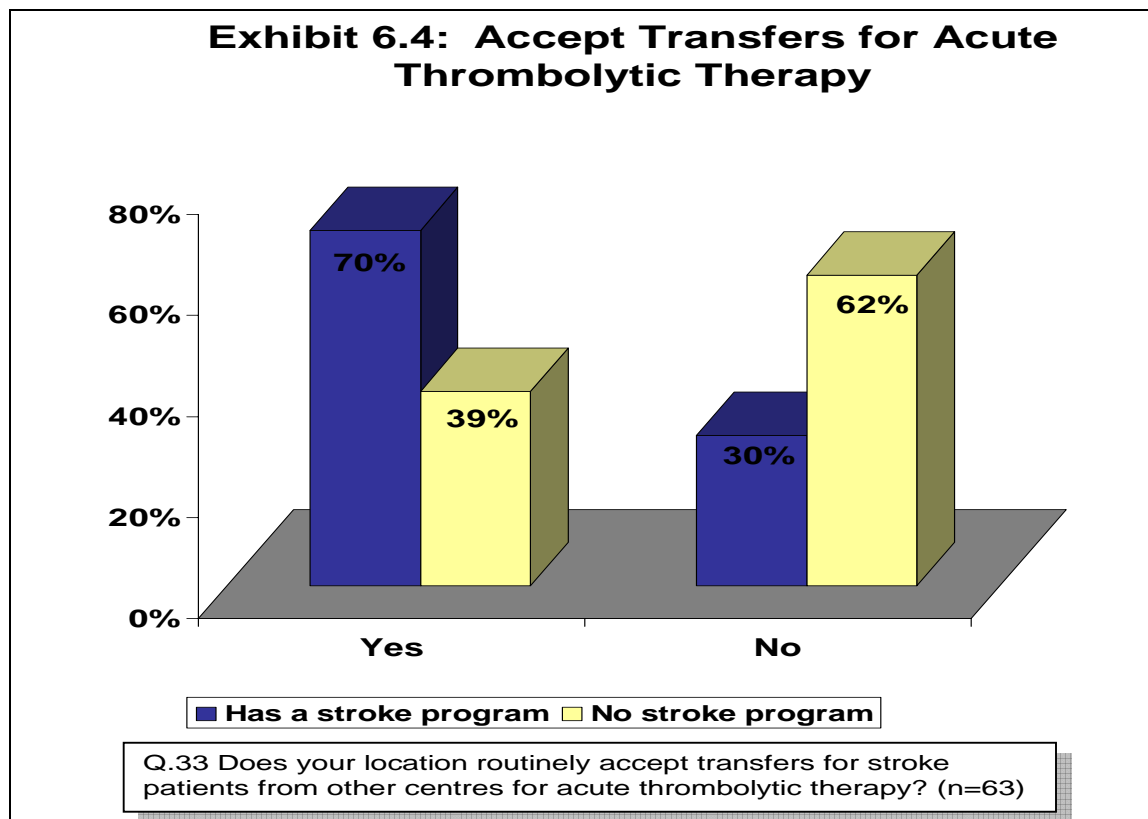
As shown in **Exhibit 3.7**, about two thirds of teaching hospitals (62%) and community hospitals (60%) provide acute thrombolytic therapy such as tPA for acute stroke patients.



In addition, as shown in **Exhibit 3.8**, those facilities with a recognized stroke program (66%) are more likely to provide acute thrombolytic therapy than those locations without a recognized stroke program (34%).



The majority (88%) of teaching hospitals that provide acute thrombolytic therapy routinely accept transfers from other locations. Also, those locations with a recognized stroke program (70%) are more likely to accept transfers from other locations to provide acute thrombolytic therapy for stroke patients (**Exhibit 3.9**).



Three-quarters (75%) of those locations that do not provide acute thrombolytic therapy routinely transfer stroke patients to another facility for the therapy. The median distance between that location and the transfer location is 60 kilometres while the median distance in time is 40 minutes.

The majority of those locations that do not have access to neurosurgical services (84%), have an arrangement with another location for these services when needed. The median distance between these facilities and the referral location for neurosurgical services is approximately 126 kilometres.

- For teaching hospitals the median distance to a referral location for neurosurgical services is approximately it is 12.5 kilometres;
- For community hospitals the median distance to a referral location for neurosurgical services is approximately it is 110 kilometres; and
- For small/rural hospitals the median distance to a referral location for neurosurgical services is approximately it is 159 kilometres.

### 3.7 Stroke Rehabilitation

The majority of teaching hospitals (80%), community hospitals (84%), and independent rehabilitation centres (86%) with stroke rehabilitation beds offer outpatient rehabilitation programs or services for stroke patients (**Table 3.8**).

**Table 3.8: Out Patient Rehabilitation Programs**

	Type of Facility			
	Teaching Hospital	Community Hospital	Small/Rural Hospital	Independent Rehab Centres
Yes	80%	84%	64%	86%
No	20%	16%	36%	14%
(Q.46) Does your facility offer outpatient rehabilitation programs or services for stroke patients? (n=79)				

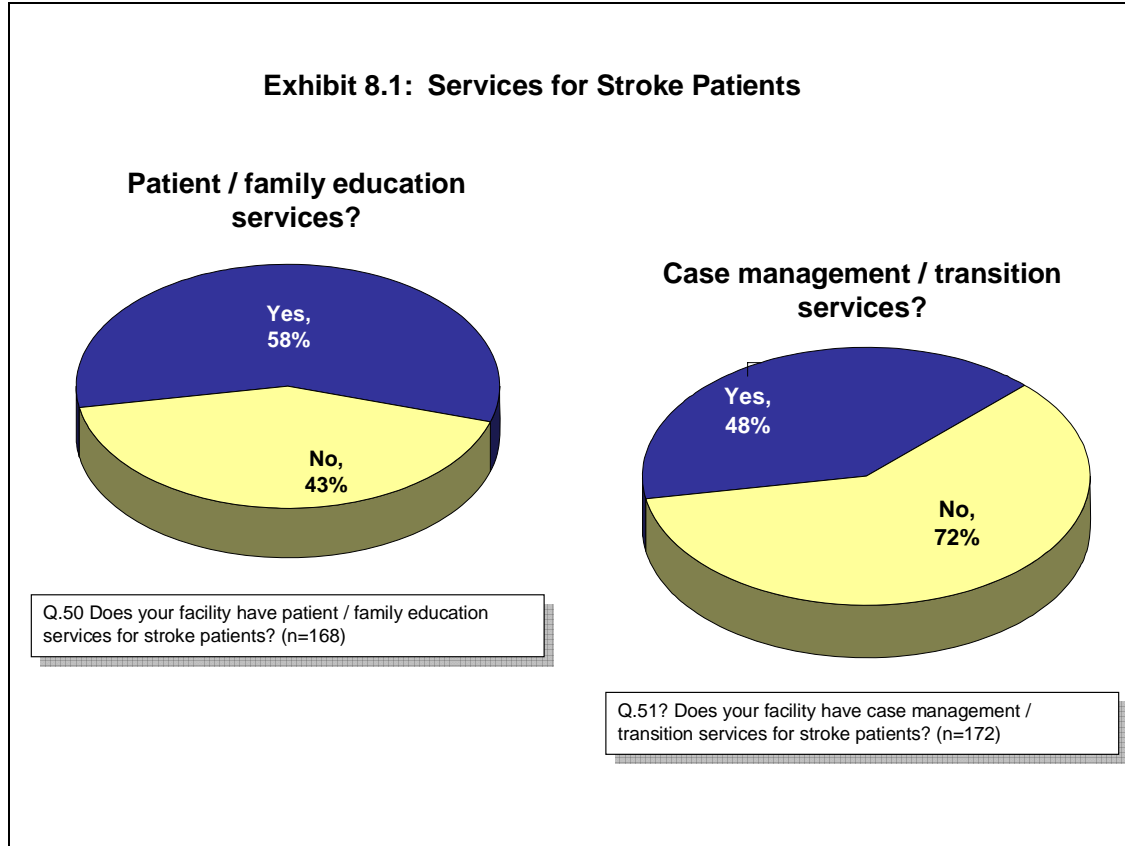
All community hospitals, small/rural hospitals and independent rehabilitation centres that have rehabilitation beds and offer outpatient rehabilitation programs or services for stroke patients base the length of stay on an individualized basis (**Table 3.9**).

**Table 3.9: Length of Stay**

	Type of Facility			
	Teaching Hospital	Community Hospital	Small/Rural Hospital	Independent Rehab Centres
Individualized	86%	100%	100%	100%
Set	14%	0%	0%	0%
(Q.47) Is length of stay set or individualized for your stroke rehabilitation patients in the outpatient service? (n=56)				

### 3.8 Discharge Planning

Just over half (58%) of all locations surveyed report offering patient / family education services for stroke patients while about half (48%) offer case management / transition services for stroke patients (**Exhibit 3.10**).



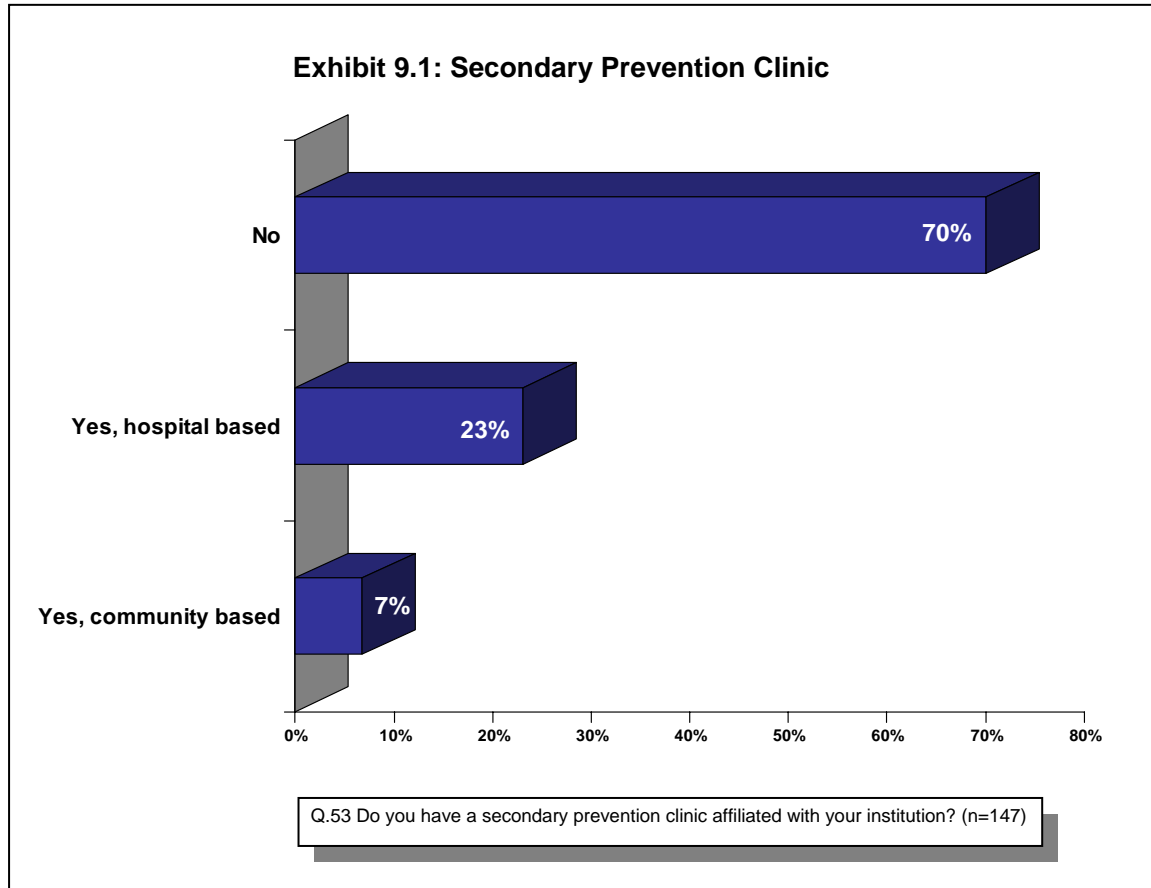
As can be seen in **Table 3.10** below, the most common approach used when planning client/family meetings for a stroke patient's discharge is to organize the meetings on an as needed basis (75%).

**Table 3.10: Approach to Discharge Planning**

Approach	% of Responses
Meetings are organized on an as needed basis	<b>75%</b>
A formal approach is used to organize a meeting	32%
No meetings are conducted	6%
Q.52 What type of approach do you take with regard to client / family meetings when planning a stroke patient's discharge? (n=153) Percentages do not total 100 as multiple responses were permitted.	

### 3.9 Secondary Prevention

The large majority of respondents (70%) indicated they do not have a secondary stroke prevention clinic affiliated with their institution (**Exhibit 3.11**).



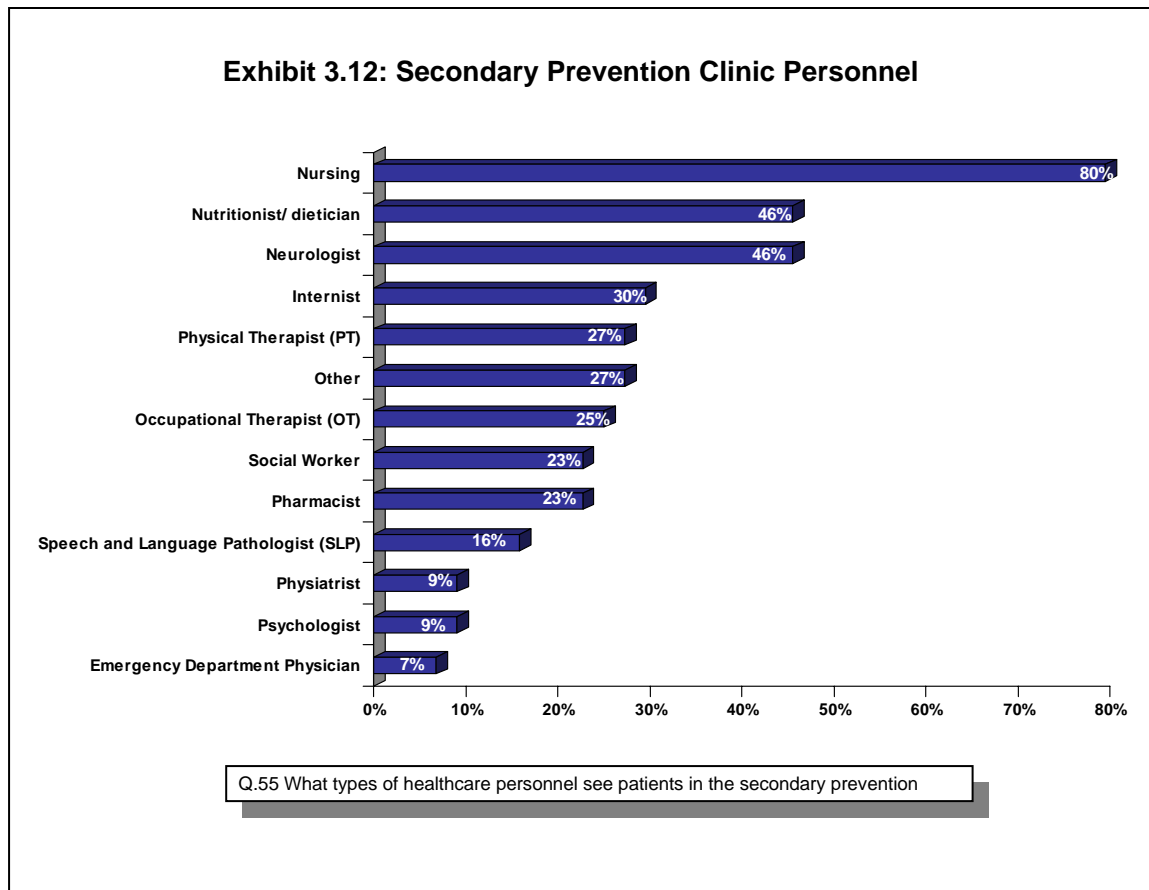
As shown in **Table 3.11** below, there is considerable variation in the number of hours per day and days per week that prevention clinics for stroke operate. Overall, 60% of clinics operate for 5 hours or more for each day they run, and 70% of institutions are affiliated with clinics which operate for 3 days or less per week.

**Table 3.11: Frequency of Operation of Secondary Prevention Clinic**

Number of Hours	Number of Days				
	One	Two	Three	Four	Five
3.5 hours or less	33%	9%	25%	0%	10%
4 hours	17%	18%	50%	0%	10%
5 to 7.5 hours	50%	55%	13%	0%	30%
8 hours	0%	18%	13%	100%	50%

Q.54/55 How often does the secondary prevention clinic run per week? (n=43)

Nurses are the most consistently identified healthcare personnel to see patients in secondary prevention clinics (80%) followed by neurologists (46%) and nutritionists/dietitians (46%) (Exhibit 3.12).



The most frequent referrals following discharge from prevention clinics are made to home care/support referrals (94%) and long term care (81%). The agency least likely to be referred to is the Provincial heart health program as just one in five respondents refer discharged stroke patients to these programs (Table 3.13).

**Table 3.13: Referral to Community-based Agencies**

	Yes	No	Don't know
Home care/support referrals	94%	2%	5%
Long term care	81%	11%	8%
Stroke prevention clinics	53%	42%	5%
Community stroke survivor groups	42%	45%	13%
Public health units	23%	57%	21%
Provincial heart health program	19%	58%	23%

Q.58 After discharge, do you refer patients to any of the following community-based agencies for stroke prevention supports? (n=62)

## 4.0 Comments

This survey has provided valuable information on the availability of stroke services and resources across Canada. Several key messages emerge from the findings of this survey:

- ❖ Recognized stroke programs exist in one-third of responding hospitals, and the majority of these are located in teaching hospitals, and independent rehabilitation facilities;
- ❖ Stroke protocols are in place in about half of responding hospitals in Canada, and the majority are in the area of acute care;
- ❖ Best practices are more likely to be used in rehabilitation centres, largely due to the impact of the SCORE program;
- ❖ Nurses play a key role on multidisciplinary stroke teams in hospitals and in stroke prevention clinics;
- ❖ CT scanners are readily available for stroke patients in most provinces, either within healthcare organizations, or within 30 minutes travel time;
- ❖ About 55 per cent of hospitals responding to the survey say that they use pre-hospital guidelines/EMS protocols for stroke care. This is critical because there is such a short treatment window for tPA;
- ❖ Access to acute thrombolytics are limited across Canada, and more likely to be available in an institution with a recognized stroke program than those without;
- ❖ Telemedicine technology is not being exploited in Canada and it is not getting to the people who need it the most. The most frequent use of technology is direct telephone conversations between healthcare professionals and video access to imaging between sites;
- ❖ About half of hospitals report having case management/transition services available for patients as they prepare to leave hospital following stroke;
- ❖ Patient/family education services are available at 60% of hospitals surveyed for stroke patients;
- ❖ About 70 per cent of facilities surveyed do not offer secondary prevention services – either hospital-based or community;
- ❖ Outpatient rehabilitation services are reported to be available in 77% of responding hospitals, regardless of hospital size;

The information gathered from the Stroke Services and Resource Inventory will be used by the Canadian Stroke Network, the Canadian Stroke Strategy, individual provinces, and many stakeholders to develop strategies to recognize and strengthen existing services, and to address some of the gaps identified. One initiative that has already been launched by the Canadian Stroke Strategy is the development of a set of Canadian Best Practice Recommendations for Stroke. These recommendations cover the continuum of care and are being widely disseminated to maximize uptake across Canada. Another project is the development of partnerships with industry to establish additional stroke prevention clinics, especially in provinces that currently do not have such services available.

The Canadian Stroke Strategy, a joint partnership of the Canadian Stroke Network and the Heart and Stroke Foundation of Canada, has worked closely with each province to facilitate the

development of provincial stroke strategies. This survey provides evidence as to the needs for a strategy and the areas for development as part of these strategies.

This survey will be repeated in two years time to monitor the progress and growth in stroke services and resources across Canada.

## APPENDIX ONE: Canadian Stroke Network – Stroke Services and Resource Inventory (SRSI) Final Questionnaire

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Thank you for participating in this Stroke Services and Resource Inventory. The purpose of the project is to describe the current state of stroke prevention and management across Canada.

It should take you about 20 minutes to complete, and your responses will remain completely confidential at all times. Should you need to exit the data collection phase prior to completion simply return to the URL listed in your e-mail invitation.

The Canadian Stroke Network has mandated The Antima Group, an Ottawa-based marketing research and management consulting firm, to compile the data and report on the overall results. The Antima Group and its staff are members of the (Canadian) Marketing Research Intelligence Association, which ensures that the anonymity of individual respondents is protected at all times, and member firms are subject to severe sanctions should they breach this code of ethics.

1. Please indicate your type of institution?

- Acute care hospital with emergency department with rehab beds
- Acute care hospital with emergency department without rehab beds
- Urgent care centre with rehab beds
- Urgent care centre without rehab beds
- Independent rehab centre **(ask only the following questions to these respondents: Q.2 through Q.10, Q.22 through Q.28, Section 4: Rehab, Section 5: Discharge Planning and Q.59, Q.60 and Q.62)**
- Community based program (i.e. stroke prevention clinics or rehab facility)
- Other: \_\_\_\_\_

### Section 1: Staffing and Resources

2. Does your location have a recognized stroke program?

- Yes
- No **(SKIP TO Q.7)**

3. Is the stroke program funded as part of the hospital base budget?

- Yes
- No

4. Does your institution have a dedicated stroke unit?

- Yes
- No **(SKIP TO Q.8)**

5. What types of patients are treated on your stroke unit?

- Acute stroke patients
- Acute Stroke and rehab patients
- Rehab patients only

6. What year did your stroke unit open?

\_\_\_\_\_

7. What is the average number of beds in your facility occupied by stroke patients on a typical day?

\_\_\_\_\_

8. Does your institution have a **multi-disciplinary stroke team**?

- Yes
- No (**SKIP TO Q.11**)

9. Does your facility have stroke **best practice protocols** that are used for ischemic and hemorrhagic stroke patients?

- Yes
- No

10. What type(s) of personnel make up the multi-disciplinary stroke team? (**CHECK ALL THAT APPLY**)

- Emergency Department Physician
- Neurologist
- Internist
- Nursing
- Physical Therapist (PT)
- Occupational Therapist (OT)
- Speech and Language Pathologist (SLP)
- Social Worker
- Psychiatry
- Pharmacist
- Nutritionist/ dietician
- Psychologist
- Nurse practitioner
- Other: \_\_\_\_\_

11. Do you have access to the following diagnostics resources and/or equipment for stroke patients? If so, how effectively would you say each one is being used for stroke patients? (i.e. stroke patients get to jump the queue and get priority for a CT scan) (**ASK EFFECTIVENESS ONLY IF ON-SITE = YES**)

Diagnostics	On site?		Being used effectively?				
	Yes	No	Very effectively	Somewhat effectively	Not very effectively	Not at all effectively	Don't know
a. CT Scanner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. MRI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Radiologist who can read CT scan/MRI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Trans-thoracic echo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Trans-esophageal echo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Cerebral	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Diagnostics	On site?		Being used effectively?				
	Yes	No	Very effectively	Somewhat effectively	Not very effectively	Not at all effectively	Don't know
Angiogram							
g. Carotid Duplex Ultrasound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Transcranial Doppler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. ECG	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**ASK Q.12 ONLY IF Q11a or Q11b or Q11c or Q11g = YES**

12. For the following diagnostics, please indicate if they are available at your institution 24 hours a day 7 days a week or only during the day?

Diagnostic	24 hours a day 7 days a week	Daytime only	Daytime with on call during off hours	Don't know / Not sure
CT Scanner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MRI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radiologist who can read CT scan/MRI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carotid Duplex Ultrasound	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**ASK Q.13 and Q.14 ONLY IF Q11a or Q11b or Q11c or Q11h = YES**

13. Which of the following protocols that are used for ischemic and hemorrhagic stroke patients are available at your location?

- Ct angiography
- CT perfusion
- MRI diffusion weighted imaging
- MRI perfusion imaging
- Transcranial Doppler ULTRASOUND

14. Does your location accept transfers from other locations for CT scans or MRI's?

Diagnostic	Yes	No
CT Scans	<input type="radio"/>	<input type="radio"/>
MRI's	<input type="radio"/>	<input type="radio"/>

**ASK Q.15 & Q.16 ONLY IF Q.11a = NO**

15. Is there an arrangement with another hospital to get CT scans when needed?

- Yes
- No (**SKIP TO Q.17**)

16. Approximately how far from your location is the referable hospital with a CT scanner?

- \_\_\_\_\_ KM
- Don't know

**ASK Q.17 & Q.18 ONLY IF Q.11b = NO**

17. Is there an arrangement with another hospital to get an MRI when needed?

- Yes
- No (**SKIP TO Q.19**)

18. Approximately how far from your location is the referable hospital with an MRI?

- \_\_\_\_\_ KM
- Don't know

19. Does your institution track the average wait time and/or the longest wait time between the request for an emergency CT scan and its completion?

- Yes
- No

20. What would you say is the average wait time and longest wait time between the request for an emergency CT scan and its completion?

- Average wait time: Hours \_\_\_\_\_ Minutes \_\_\_\_\_ (**SKIP TO Q.22**)
- Don't know (**GO TO Q.21**)
- Longest wait time: Hours \_\_\_\_\_ Minutes \_\_\_\_\_ (**SKIP TO Q.22**)
- Don't know (**GO TO Q.21**)

21. What would you estimate is the average wait time and longest wait time between the request for an emergency CT scan and its completion?

	Average Wait Time	Longest wait time
Less than 60 minutes	<input type="radio"/>	<input type="radio"/>
61 minutes to 120 minutes	<input type="radio"/>	<input type="radio"/>
121 minutes to 180 minutes	<input type="radio"/>	<input type="radio"/>
More than 180 minutes	<input type="radio"/>	<input type="radio"/>

22. Is your institution able to access stroke experts through telemedicine technology?(i.e. telestroke)

- Yes
- No (**SKIP TO Q.25**)

23. What modes of telemedicine do you utilize for stroke patients?

- Access neurologist by phone
- Share computer imaging
- Share video / live scan
- Other (specify): \_\_\_\_\_

24. For what components of stroke care does your institution utilize telemedicine technology? (**CHECK ALL THAT APPLY**)

- Emergency consult (i.e. to assess for tPA)
- Peer to Peer communications

- Stroke rehab
- Patient education
- Staff education
- Other (specify): \_\_\_\_\_

## Section 2: Guidelines

25. Has your institution or stroke program adopted or adapted policy or clinical guidelines for local use?

- Yes
- No (**SKIP TO Q.29**)

26. Which guidelines have influenced the organization of stroke care services at your institution? (**CHECK ALL THAT APPLY**)

- Royal College of Physicians (RCP)
- Scottish Intercollegiate Guideline Network (SIGN)
- American Stroke Association (ASA)
- Australian Guidelines
- Heart and Stroke Foundation of Ontario
- Veteran's Affairs
- Other (specify): \_\_\_\_\_

27. Please indicate the areas in your institution that use the following guidelines for stroke care. (**CHECK ALL THAT APPLY**)

- Pre-hospital
- Acute care
- Acute care Rehabilitation Outpatient Department
- Administration (e.g. Clinical Services Portfolio)
- Rehab
- Secondary prevention
- Community re-engagement
- Other (specify): \_\_\_\_\_

28. Does your institution use the same or different protocols and guidelines, depending upon where the patient is located in the institution?

- Same stroke protocols and guidelines, regardless of where the patient is located in the institution
- Different stroke protocols and guidelines depending on where the patient is located in the hospital

## Section 3: Processes of Care

29. Do ambulance personnel use a stroke triage tool?

- Yes
- No

30. Is there a pre-notification protocol from EMS to the emergency department when a stroke patient is in transit?

- Yes
- No

31. Does your facility conduct a baseline stroke assessment using NIHSS or CNS?

- National Institutes of Health Stroke Scale (NIHSS)
- Canadian Neurological Scale (CNS)
- Other (Specify: \_\_\_\_\_)

32. Does your facility have a formal protocol for the management of stroke patients in the emergency department?

- Yes
- No
- Not applicable

33. Does your location provide acute thrombolytic therapy (such as tPA) for acute stroke patients?

- Yes
- No (**SKIP TO Q.37**)

34. How many stroke patients have been thrombolysed at your site in the past 12 months?

- \_\_\_\_\_
- Don't know

35. Does your location routinely accept transfers of stroke patients from other centres for acute thrombolytic therapy?

- Yes
- No

36. Do you have a formal protocol or procedure for administering acute thrombolysis to stroke patients?

- Yes (**SKIP TO Q.39**)
- No (**SKIP TO Q.39**)

37. Does your site routinely transfer stroke patients to another centre for acute thrombolytic therapy?

- Yes
- No (**SKIP TO Q.39**)

38. Approximately how far from your location is the centre you transfer patients for acute thrombolytic therapy and how long does it take to get there?

\_\_\_\_\_ KM

\_\_\_\_\_ Minutes

- Don't know

39. Does your location have neurosurgical services?

- Yes
- No (**SKIP TO Q.41**)

40. Does your location routinely accept transfer patients from other centres for neurosurgical services?

- Yes (**SKIP TO Q.43**)
- No (**SKIP TO Q.43**)

41. Is there an arrangement with another hospital for neurosurgical services when needed?

- Yes
- No (**SKIP TO Q.43**)

42. Approximately how far from your location is the referable hospital with neurosurgical services?

- \_\_\_\_\_ KM
- Don't know

**Section 4: Rehab**

43. What is the total number of beds in your institution that are designated **Rehab Beds**? How many of these are designated for stroke patients?

- Total: \_\_\_\_\_
- Stroke Patients: \_\_\_\_\_
- Don't know

44. On average, how many new clients are admitted to your facility for stroke rehab per month?

- \_\_\_\_\_
- Don't know

45. What is the average length of stay for people with stroke in a rehab bed?

- \_\_\_\_\_ Days
- Don't know

46. Does your facility offer outpatient rehab programs or services for stroke patients?

- Yes
- No (**SKIP TO Q.50**)

47. On average, how many new stroke patients are referred to the outpatient rehab service per month?

\_\_\_\_\_

48. Is length of stay set or individualized for your stroke rehab patients in the outpatient service?

- Set
- Individualized

49. What is the average length of stay in the stroke outpatient rehab services?

Number of sessions: \_\_\_\_\_

Number of Weeks: \_\_\_\_\_

### Section 5: Discharge Planning

50. Does your facility have patient / family education services for stroke patients?

- Yes
- No

51. Does your facility have case management / transition services for stroke patients?

- Yes
- No

52. What type of approach do you take with regard to client / family meetings when planning a stroke patient's discharge? (**CHECK ALL THAT APPLY**)

- A formal approach is used to organize a meeting (e.g. part of plan)
- Meetings are organized on an as needed basis, i.e. informal approach
- No meetings are not conducted

### Section 6: Secondary Prevention

53. Do you have a secondary prevention clinic affiliated with your institution?

- Yes, hospital based
- Yes, community based
- No (**SKIP TO Q.59**)

54. How often does the secondary prevention clinic run per week?

Number of day: \_\_\_\_\_  
Numbers of hours per day: \_\_\_\_\_

55. What types of healthcare personnel see patients in the secondary prevention clinic?

- Emergency Department Physician
- Neurologist
- Internist
- Nursing
- Physical Therapist (PT)
- Occupational Therapist (OT)
- Speech and Language Pathologist (SLP)
- Social Worker
- Psychiatrist
- Pharmacist
- Nutritionist/ dietician
- Psychologist
- Other: \_\_\_\_\_

56. Do you track the number of new referrals for secondary prevention at your locations?

- Yes
- No (**SKIP TO Q.58**)

57. What is the number of new referrals to secondary prevention per month?

\_\_\_\_\_

58. After discharge, do you refer patients to any of the following community-based agencies for stroke prevention supports?

	Yes	No	Don't know
Long term care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Home care/support referrals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stroke prevention clinics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public health units	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community stroke survivor groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provincial heart health program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Section 7: Descriptive Characteristics**

To conclude the SRSI, we would like to obtain some information from you to help us classify the results. Only aggregate (combined) responses will be presented and used for analysis. Your individual responses will remain completely confidential.

59. Please indicate the total number of beds in your location?

\_\_\_\_\_

60. What was the total number of stroke patients (inpatients and emergency only patients) admitted to your location during the past year (2005)?

\_\_\_\_\_

61. Of that number (Q.60), how many were:

Discharged directly from emergency? \_\_\_\_\_  
 Admitted? \_\_\_\_\_

TOTAL SHOULD ADD UP TO NUMBER IN Q.60

62. What was the total number of inpatient beds designated to/occupied by stroke patients (2005)?

\_\_\_\_\_

63. Is your institution classified as a ...?

- Teaching hospital
- Community hospital
- Small / rural hospital

**Thank you for participating in this study!**

**APPENDIX TWO: Provincial Cover Letter (Sample from Ontario)**

May 29, 2006

**Re: Inventory of Stroke Services**

Stroke is a leading cause of adult disability and death in Canada. With the goal of improving stroke outcomes, hundreds of stroke patients, health professionals, associations, hospital administrators, and policy-makers have banded together to develop a Canadian Stroke Strategy. This innovation is occurring at the provincial, territorial and regional levels, where local champions are making real changes to the health care system. At a national level, we would like to support these local champions by providing an accurate picture of the state of stroke care in Canada. We are surveying all hospitals in Canada to gather baseline information on stroke care. Over time, we will be able to measure an improvement in these services.

For this reason, **we are asking you to spend approximately 20 minutes completing an easy-to use web-based inventory that will be sent to you by e-mail on Thursday, June 1.**

The inventory is being sponsored by the Canadian Stroke Network (a Network of Centres of Excellence), in cooperation with the Heart and Stroke Foundation of Canada and the Canadian Stroke Consortium. The inventory focuses on the services available to stroke patients in your facility. Please answer the questions as accurately as possible in order for us to obtain a realistic picture. If you are not the appropriate person to complete this inventory, please forward it to the correct person when it arrives by e-mail. The results of this survey will be summarized at a national and provincial/territorial level, but the data on your individual facility or health region will remain confidential and will not be released publicly. The final report will be made accessible to all respondents.

Within Ontario, we have some information on stroke services at hospitals designated as regional stroke centres as part of the Ontario Stroke System, and are lacking this information from all other Ontario hospitals. The Ontario Stroke Evaluation Advisory has been working closely with the Canadian Stroke Strategy in the development of this survey and in the development of the strategy overall, and supports this survey. It will provide valuable up-to-date information about the availability of stroke resources during the acute and rehabilitation phases of the continuum of care across Ontario. This will help to inform LHINs about resources and gaps.

Thank you in advance for your cooperation and for helping make a real difference to those in Ontario affected by stroke.

Sincerely yours,

Dr. Antoine Hakim  
CEO and Scientific Director,  
Canadian Stroke Network

Rocco Rossi  
CEO, Heart and Stroke  
Foundation of  
Ontario

Dr. Philip Teal  
Chair, Canadian Stroke  
Consortium

May 29, 2006

**APPENDIX THREE: Email Invitation to Complete Survey**

Re: Inventory of Stroke Services

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Dr. Antoine Hakim  
CEO and Scientific Director,  
Canadian Stroke Network

Rocco Rossi  
CEO,  
Heart and Stroke Foundation of Ontario

Dr. Philip Teal  
Chair, Canadian Stroke Consortium

To view the official invitation that has been verified and signed by the CEO and Scientific Director, of the Canadian Stroke Network, the CEO of your provincial Heart and Stroke Foundation and the Chair of the Canadian Stroke Consortium, please click on the following link.

[http://www.openvenue.com/cs/6725/ON\\_National\\_Stroke\\_Survey\\_Cover\\_Letter\\_2006.pdf](http://www.openvenue.com/cs/6725/ON_National_Stroke_Survey_Cover_Letter_2006.pdf)