

British Columbia Stroke Strategy

TIA Rapid Assessment Action Plans



Submitted by:
TIA Rapid Assessment Working Group
in collaboration with each Health Authority

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1.0 Project Purpose

Rapid management of transient ischemic attacks (TIAs) is one of the most cost-effective interventions to reduce the burden of stroke. This initiative will provide each health authority with the opportunity to improve rapid assessment of TIAs through changes in how stroke patients are diagnosed and treated. The focus will be on systematic changes to the health care system within each region. However, it is recognized that in some cases a portion of funding may be allocated to establishing the infrastructure necessary to support system changes.

2.0 Project Priority

The priority for improving TIA rapid assessment was identified in recommendations by the British Columbia Stroke Strategy Steering Committee. Specifically:

That \$1 million [be] invested into developing or adding secondary prevention capacity in all health regions. The exact form of this capacity building would be determined individually by each region.

This priority is fully supported by the “British Columbia Stroke Strategy, 2005”, and the report “Innovations in Stroke Care, 2007”.

3.0 Background

The British Columbia Stroke Strategy, developed in 2005, identified the need for an organized and comprehensive program for stroke prevention. This included recommendations to improve access to stroke specialists through rapid assessment of patients who have suffered a TIA and those that have significant stroke risk and are referred from their GP.

TIAs are associated with a relatively high risk of stroke. A recent meta-analysis identified that 5% of strokes occur within 48 hours of a TIA and another 5% over the next 90 days; these figures have been estimated to range up to 20%. If patients are not seen within 48 hours, a significant number of strokes will be missed.

Lavallee et al (2007), claim that the use of TIA clinics with 24 hour rapid access and preventative treatment may greatly reduce hospital length of stay and risk of stroke. Rothwell et al, concludes that early initiation of existing treatments following a TIA or minor stroke is associated with an 80% reduction in the risk of early recurrent stroke.

Through the use of Stroke Prevention Clinics and education initiatives, as part of the Ontario Stroke Strategy, there has been marked improvement in the evaluation of TIA patients in Ontario.

In 2000, just 43% of TIA patients arriving at regional stroke centres received CT or MRI imaging in the emergency department. By 2003, with the organization and medical education provided within the Stroke Strategy, the number of patients receiving appropriate imaging had grown significantly to 78%.

The establishment of rapid assessment functions in each health authority will be instrumental in reducing the incidence of strokes following TIAs and in at-risk patients.

Each health authority has reviewed and proposed actions to improve rapid assessment of TIAs. The number of TIAs by region was projected by Dr. Andrew Penn as part of the work contributing to the TIA rapid assessment initiative.

	Vancouver Island	Fraser	Coastal	Interior	BC
Population	750,000	1.3 mill	1.5 mill	800,000	4.35 mill
Projected TIAs	1261	2186	2522	1345	7314
% of Total TIAs	17.2	29.9	34.5	18.4	100%

While these projections do not include the Northern Health Authority, by far the greatest concentration of TIAs occurs in the densely populated Lower Mainland region. Secondary prevention and rapid assessment facilities are also not equally distributed, with facilities and services being better organized in the Vancouver Island and Vancouver Coastal Health Authorities compared to other regions. The TIA initiative provides an opportunity to address this disparity.

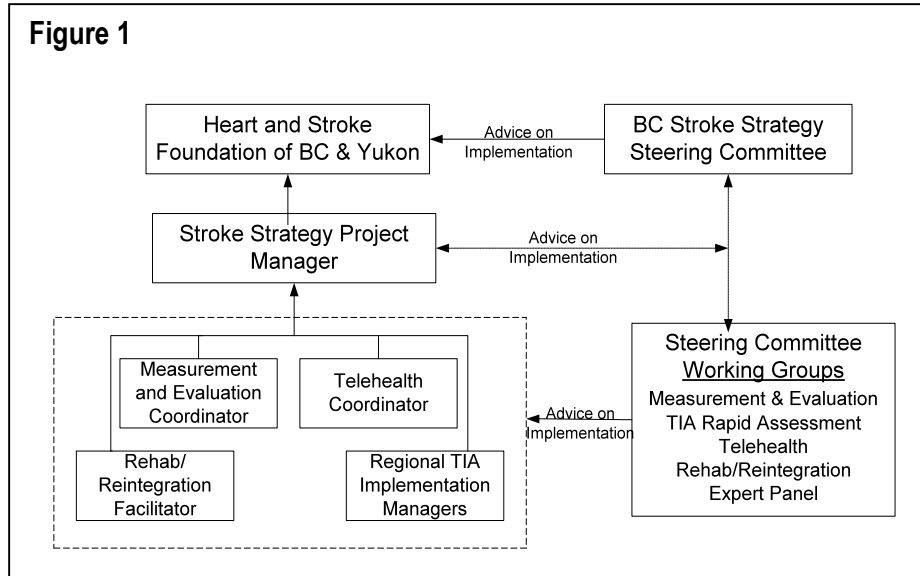
4.0 Project Management

The governance structure for implementing the Stroke Strategy is shown in Figure 1. The Heart and Stroke Foundation of BC and Yukon (HSFBC) has the mandate to allocate funding to specific stroke initiatives. Priorities for funding are determined in consultation with a Stroke Strategy Steering Committee, comprised of representatives from the health authorities, NGOs and the provincial government. The Steering Committee has established four working groups to assist with the development of action plans for implementing Stroke Strategy priorities.

Implementation will be managed by the Stroke Strategy Project Manager. Coordinators for specific initiatives will report to the Project Manager, but will also work closely with the Steering Committee working groups. The Project Manager will also receive advice and guidance on implementing specific initiatives from the working groups and the Steering Committee.

The Stroke Strategy Project Manager will oversee the implementation of the TIA rapid assessment initiative. However, the majority of work will be done directly by each health authority and a project lead will be identified to work with the Project Manager. Each health authority will be expected to:

- Establish and implement the work program within the two year timeframe;
- Establish and implement an evaluation program for TIA rapid assessment in consultation with the Measurement and Evaluation Coordinator;
- Report to the Project Manager and to the Steering Committee; and
- Pursue additional funding and resource commitments from within the health authority to sustain the rapid assessment function.



5.0 Summary of Proposals for TIA Rapid Assessment

All five health authorities have provided proposals for funding TIA rapid assessment. The proposals are summarized in the following discussion. The funding request and allocations within budget are shown in Table 1.

Table 1: Funding Request and Allocation

	Interior Health	Fraser Health	Vancouver Coastal	Vancouver Island	Northern Health	Totals
Funding request	\$200,000	\$365,000	\$179,500	\$277,000	\$172,500	\$1,194,000
Funding allocated within Budget	\$200,000	\$248,000	\$179,500	\$200,000	\$172,500	\$1,000,000
Additional Funding Request*		\$117,000		\$77,000		\$194,000
						\$1,194,000

*Additional funding is contingent upon future contributions from either the Ministry of Health or alternative sources.

Each health authority will be required to allocate a portion of funding to the evaluation of their TIA rapid assessment initiative. The evaluation program will be designed in consultation with the Measurement and Evaluation Working Group and standards for data collection and reporting must be adhered to.

Health authority proposals are summarized in the following discussion and presented in more detail in the appendix. Each health authority will present their proposal at the Steering Committee meeting on April 16, prior to final budget approval. Due to the timeframe in which some submissions were received, additional clarification has been requested from the Northern Health Authority on specific initiatives for improving TIA rapid assessment and anticipated outcomes. This clarification may be provided at the Steering Committee meeting.

5.1 Interior Health

The Interior Health Authority will assess and implement system changes across the four Health Services Areas within the region, leading to improved access around diagnostics, tracking and referring patients who have been referred into a facility for treatment, and timely follow up for patients who are considered high-risk after an initial TIA/mild stroke.

The assessment and redesign of the system will be done through a collaborative process with all stakeholders within each of the four Health Service Areas and their surrounding communities. Funding will be used for:

- Establishing a project lead and change management expert to coordinate the process across Interior Health.
- Identification of Health Service Area stakeholders and establishing a collaborative process leading to changes in how patients with TIAs receive treatment and access to the health care system.
- Conducting an assessment of referral patterns for TIA across all sites, developing an inventory of current tests provided at each referral site, assessing existing booking procedures and interactions, and identification of current turn-around times for diagnostic tests and neurology referrals to measure anticipated improvements in access to service.
- Through the collaborative, developing consensus on systematic changes to diagnose and refer TIA/Minor Stroke Rapid Assessment patients who have had a risk assessment completed using the ABCD stroke assessment risk scoring tool.
- The focus will be on the eight larger facilities across Interior Health (Kelowna, Kamloops, Vernon, Penticton, Cranbrook, Trail, Williams Lake and Salmon Arm).

5.2 Fraser Health

Fraser Health proposes to establish a network of TIA/Stroke Prevention Clinics in the region to facilitate rapid assessment and short-term follow-up for patients experiencing symptoms of a TIA or mild stroke. The focus will be on assessment, urgent investigations to determine the cause, and facilitated access to treatment. Establishing the three clinics will reduce the number of in-patient hospital admissions and the incidence of strokes and stroke reoccurrences. Long-term follow-up of patients will continue to be done through family physicians and other hospital and community-based services.

In addition to provision of direct services, the network of clinics will provide regional leadership in the broader aspects of secondary stroke prevention including education of health care providers around stroke detection, prevention, and appropriate clinic referrals, development of guidelines for post-TIA/stroke follow-up and risk factor management, maintaining awareness and promoting the use of relevant hospital and community resources (e.g., chronic disease management programs, community support groups, etc).

Three TIA/Stroke Prevention Clinics will be established. Locations include Abbotsford Regional Hospital and Cancer Centre, Surrey Memorial Hospital and Royal Columbian Hospital. Funding will be used for equipment and staff to provide patient treatment and case management. The proposal by Fraser Health focuses on a multi-year stroke strategy with an ongoing investment in the range of \$500,000 or more per year in the three clinics.

5.3 Vancouver Island Health

The Stroke Rapid Assessment Unit (SRAU) at Victoria General will be expanded to five days per week. Funding will be used for additional nursing and clerical staff to increase the capacity of the SRAU and to reduce wait times. A second clinic will be opened in Campbell River. This out-patient clinic could be open by June 2008 and will have nursing and clerical support. One-time funding will be assigned for a lean design process to review the current throughput and function of the SRAU in Victoria. Additional support will be provided to enhance the existing database and to provide an Island-wide data collection and monitoring process. A stroke nurse practitioner will also be assigned to coordinate care throughout the Island.

5.4 Vancouver Coastal

Vancouver Coastal will introduce systematic changes at a regional level to increase access and shorten wait times to specialized assessment for patients who have experienced a TIA. Specifically, the project will provide patients who have had a TIA or minor stroke with more efficient access to necessary diagnostic testing and treatment.

The scope of the proposal involves changes at three hospital sites in Vancouver Coastal Health: Vancouver General Hospital (VGH), Lions Gate Hospital (LGH), and St. Paul's Hospital (SPH), with linkages to all community and rural institutions in Vancouver Coastal. This proposal provides a health authority-wide approach designed to increase timely patient access to necessary TIA treatment and diagnostic testing. Three different models to improve patient access, and the related resource requirements, are presented for the three sites (VGH, LGH and SPH) across the region.

At VGH, improving rapid access requires that the clinic be open an additional one to 1.5 days per week. The resource requirements to do this involve increasing the current nursing staff to a full-time position. The impact of additional funding would increase the number of patients seen in the clinic by approximately 30 to 45 patients per week.

At LGH, the focus will be on improving access for patients in these areas by developing, maintaining and strengthening a formalized link with GPs in the coastal region. A part-time nurse would perform an education and relationship establishment function that would include disseminating information to GPs regarding appropriate TIA diagnosis and treatment, and creating

a formal link between GPs and neurologists at LGH. This also includes developing standardized protocol forms that GPs would send directly to the LGH neurologist office, which would increase efficiency with expediting necessary assessments.

At SPH, the plan to improve patient access is two-fold and targets those patients presenting to the ED, as well as in GP offices. First, by creating a TIA/minor stroke pathway for the existing Diagnostic and Treatment Unit (DTU) in the ED, patients who present with stroke-like symptoms requiring further investigation and consultation by a neurologist can be held in the observation unit of the ED, and receive expedited investigations and treatment as well as a period of observation, thereby decreasing the need for admission to hospital. The infrastructure for this proposal is already in place and start-up costs are considered minimal.

The second component of the SPH plan is to improve access for those patients who do not present in the ED, as these patients often have greatest barriers to timely assessment. The plan is to re-dedicate a half-day per week exclusively to this group of patients, with the option of expanding further, depending on demand. Funding is being sought for a nurse to perform initial assessments as well as organize and book further testing and consultations as needed.

5.5 Northern Health

Northern Health proposes to continue to assess and implement processes that will support timely access to services such as initial identification of TIA/stroke patients, diagnostics, tracking and appropriate follow up or referral patterns. The project will include furthering the work of a health authority stroke/TIA steering committee. This committee has provided a forum for discussion specific to the TIA/stroke protocols as well as supporting our clinical lead. The committee will steer the direction of engagement and provide linkages between services.

All three health service delivery areas will participate in the stroke committee. The proposal includes resources to support reorganization of the system and assistance with education and training for health care providers. It also includes resources to assist a physician champion to work collaboratively with a coordinator and provide leadership to the team.

Specific tasks include:

- Recruitment of a coordinator to provide direction and guidance across Northern Health
- Recruitment of educator/trainer to assist with meeting the needs of health care providers
- Continued support for the steering committee, which includes representation from Neurology, Emergency Department, Diagnostic Services, Telehealth, BCAS, Care North.
- Continued collaboration with all stakeholders in each of the HSDAs to determine areas of improvement for timely access to services.
- Inventory of current diagnostic tests, capacity and availability at each facility including waitlists.
- Inventory of current referral patterns and barriers to access to additional services for referral.
- Consensus around revisions to triage algorithms and order sets.
- Education and training for algorithms and order sets.
- Implementation of consistent practice in the use of algorithms and order sets.

- Development of documentation forms for practice and evaluative processes.

Appendix 1
Health Authority Proposals for
TIA Rapid Assessment



TIA Rapid Assessment Proposal

Background

Access to rapid assessment for patients who have experienced a TIA varies across our health authority. According to Rothwell (2007), "The risk of stroke in the week after a transient ischemic attack or minor stroke is high and relatively predictable. Emergency investigation and treatment is justified." It is also noted that about 15-20 % of patients who experience a stroke experienced a TIA prior to the stroke. Rothwell describes validated models that can be used to predict the early risk of Stroke after a TIA and with these tools physicians can identify which patients require referral for emergency assessment.

Lavallee et al (2007), claim that the use of TIA clinics with 24 hour rapid access and preventative treatment may greatly reduce hospital length of stay and risk of stroke. Rothwell et al, concludes that early initiation of existing treatments following a TIA or minor stroke is associated with an 80% reduction in the risk of early recurrent stroke.

The Emergency Department Current Practice Indicators Project (CPIP) was designed to provide a snapshot of patient management practices as they are delivered by Emergency Departments and Urgent Care Centers across BC. The Emergency Department Current Practice Indicator Project data collection results, July 2007 for Interior Health prepared by Global Medical Services indicated there was a high degree of variability around the process to access services and provide follow up or consultation for TIA or minor stroke patients across Interior Health.

Out of 10 sites audited in Interior Health, only one facility reported any patients being referred to a Stroke Prevention Clinic (7%). One of the most obvious reasons is that there is a lack of formalized stroke prevention clinics in the IH. An attempt was made to determine if patients were referred to a local specialist for follow-up but this was not easily discernable by external chart auditors. High risk TIA patients are at significant risk to have a stroke and best practices suggest these patients be followed up urgently in a Stroke Prevention Clinic.

There was a significant variance in instance totals for sites advising patients to follow-up with their family physicians (0% - 67%). A significant gap exists between the findings and the suggested target to have most Stroke/TIA patients advised to seek follow-up care with their family physicians.

It has been recognized that process changes within each of the four Health Service areas are required to improve timely access to services.

Objective

To assess and implement system changes across the four Health Services Areas within Interior Health that will lead to improved processes related to access to services. Access includes diagnostics, tracking and referring patients who have been referred into a facility for treatment and

follow up for patients who are considered high risk after an initial TIA/Mild Stroke in a timely manner.

Scope

The assessment of current processes and resources and the redesign of the system and linkages between the services through a collaborative process with all stakeholders within each of the four Health Service Areas and their surrounding communities are within the scope of this project. This proposal may include adding a resource to assist with reorganization of the system as well as a resource to provide education for the providers in acute care, the booking clerks and the Medical Office Assistants working in physician practices.

Description of the Work

- Identification of a project lead and change management expert to coordinate the process across Interior Health.
- Identification of Health Service Area Stakeholders including representation from Neurology or Internal Medicine, Emergency Departments, Diagnostic Services, Rehabilitation, Hospital Administration, Booking clerks and Medical Office Assistants.
- Collaboration with all stakeholders in each of the Health Service Areas will be initiated to determine what needs to be done within the Health Service Area to improve access.
- An identification of all Health Service Area sites/ communities, Primary Care Physicians and referral patterns will be required.
- An inventory of current tests provided at each referral site, existing booking procedures and interactions will be required.
- Identification of current turn around times for diagnostic tests and neurology referrals is required to measure anticipated improvements in access to service.
- Consensus will be obtained around a process to refer TIA/Minor Stroke Rapid Assessment patients who have had a risk assessment completed using the ABCD stroke assessment risk scoring tool.
- Consensus around the requirements or expectations of a follow up visit will be determined at each of the 8 larger facilities across IH. The eight sites include Kelowna, Kamloops, Vernon, Penticton, Cranbrook, Trail, Williams Lake and Salmon Arm.
- Follow up visits will likely include a nursing history, a stroke assessment, medical imaging and a neurology/ internal medicine to identify:
 - a. Carotid Stenosis requiring Endarterectomy
 - b. Atrial Fibrillation or Cardioembolic Disease requiring Warfarin
 - c. Small Vessel Disease requiring medical management
 - d. Other Stroke Syndromes

e. Non-Stroke symptoms

Once this is completed the follow up for the patient will likely be managed in one of the following treatment categories.

1. Critical Carotid Stenosis requiring admission and consultation by a vascular surgeon for possible endarterectomy.
 2. Cardioembolic Disease requiring anticoagulation.
 3. Small vessel disease requiring medical management.
 4. Other, non stroke.
- A rapid assessment algorithm will be developed for each of the four treatment categories.
 - Communications will be developed for patients and providers which outlined the process and expectations.
 - Documentation tools will be developed including referral forms, order sets and referral algorithms.
 - Education/ orientation will be provided to all stakeholders.

Key Indicators

Service standards or targets will be identified by the stakeholders. Baseline measures will be completed and indicators determined to measure performance improvement ie. time from initial referral to consultant, time from order to CT scan/diagnostic.

Budget

Job Title	HSA	Time Period	Cost
Project Coordinator/ Change Management Consultant	Thomson Cariboo Shuswap	4 month contract	\$ 75,000
Project Coordinator/ Change Management Consultant	East Kootenay and Kootenay Boundary	4 month contract	\$ 50,000
Project Coordinator/ Change Management Consultant	Okanagan	4 month contract	\$50,000
Collaborative Meeting Costs			\$25,000
Total Cost			\$200,000

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Proposal to Establish a Network of TIA/Stroke Prevention Clinics in Fraser Health

March 31, 2008

Executive Summary

The *BC Stroke Strategy* was released in November 2005. The strategy proposes the development of an **organized and comprehensive** program for stroke prevention and care in each health authority, with the payoffs being prevention of disability and death, improvement in the quality of life, and reduced health care costs. In follow-up to the provincial process, a regional process was recently initiated in Fraser Health Authority (FH) to develop a FH Stroke Strategy. This document proposes a plan for meeting one component of the BC (and FH) Stroke Strategy, namely the establishment of a network of three TIA/Stroke Prevention Clinics in Fraser Health: one in Fraser East (FE), one in Fraser South (FS), and one in Fraser North (FN).

The target group for the FH TIA/Stroke Prevention Clinics will be stable patients that have recently experienced symptoms of a Transient Ischemic Attack (TIA) or mild stroke. The clinics will provide rapid access (within 48 hours) to assessment (nurse and neurologist), diagnostic imaging, and urgent treatment. Patients will be referred to the clinics by physicians in (1) family physician and specialists offices; (2) walk-in clinics; and (3) emergency departments. Patients will visit the clinic once and follow-up care will be provided by their family physician. If required, the clinic will coordinate referrals to specialists (e.g., cardiologist, vascular surgeon, and/or neurologist), specialty clinics, and allied health providers (e.g., dietitian, physiotherapist, pharmacist, etc).

Follow-up of TIAs/mild strokes has traditionally been carried out in individual physician's offices +/- emergency departments in FH. There are often delays in scheduling, in access to investigative procedures, and in appropriate management. The *FH Current Practice Indicator Report (2006)* reported that only 22% of a sample of patients presenting to FH EDs with a stroke/TIA were referred to some form of a stroke prevention clinic (e.g., risk reduction clinic in FH or stroke prevention clinic at Vancouver General Hospital). Seven out of 12 FH sites made no referrals. The report noted that FH has room for improvement in this area.

Rapid access to assessment, diagnostic imaging, and urgent treatment is important as about 30 – 40% of patients who experience a stroke will have experienced a preceding TIA or minor stroke. The risk is highest in the immediate (up to 72 hours) post TIA/mild stroke period. Early initiation of treatment after a TIA or minor stroke in a clinic setting has been associated with an 80% reduction in the risk of early recurrent stroke. In addition to provision of direct services, the clinics will provide regional leadership in the broader aspects of secondary stroke prevention.

Projected FH TIA/Stroke Prevention Clinic Volumes

The FH TIA/Stroke Prevention Clinic visit volumes are anticipated to be 1500 in 2008/09 (750 if assume an October 1, 2008 opening), 1900 in 2009/10, 2275 in 2010/11, 2500 in 2015 and 2700 in 2020.¹ Of these visits, 40% will be in each of the FN and FS clinics and 20% in the FE clinic. See Table 1.

Table 1: FH TIA/Stroke Prevention Clinic Visit Volumes, 2008 - 2020

	FH Population					Projected TIA/Stroke Prevention Visits Rates (includes a 42% Mimic Rate)				
						Clinic Capture Rate for Out-patient Care				
	2008	2009	2010	2015	2020	40%	50%	60%	60%	60%
FE	332,625	338,294	344,101	374,046	402,680	313	398	486	528	569
FN	566,732	576,865	588,592	647,464	703,034	534	679	831	915	993
FS	652,767	665,075	677,828	742,153	804,267	615	783	957	1,048	1,136
Total, FH	1,552,124	1,580,234	1,610,520	1,763,662	1,909,981	1,462	1,860	2,275	2,491	2,698

Visits to the FH TIA/Stroke Prevention Clinic are anticipated to be a combination of:

- “New patients”: Patients whose assessment and arrangement for diagnostic services would have been previously carried out in an individual physician’s office +/- emergency department. This will be the initial target group to be served by the FH clinics.
- “Repatriated VCH patients”: Patients who would have previously been referred to the TIA/Stroke Prevention Clinic at Vancouver General (VGH). This transition is expected to occur gradually as (a) FH clinics get established; and (b) there is increased pressure on the VGH clinic to focus on Vancouver Coastal (VCH) patients (also with a growing, aging population). Discussions have been initiated with VCH to ensure a smooth transition.

FH TIA/Stroke Prevention Clinic Hours

Two, four, and five half-day clinics per week will be required in 2008/09 in FE, FN, and FS respectively (total 11 half-day clinics in FH).² This number will increase each year as clinic volumes increase (20 half-day clinics will be required in 2020). See Table 2.

¹ The volume is estimated by applying the TIA/mild stroke incidence rates reported in the Oxford Vascular Study to the FH population and assuming clinic capture rates of 40%, 50% and 60% in years 2008/09, 2009/10, and 2010/11 and beyond. Capture rates were based on the Vancouver Island HA experience of 65% (while at the same time acknowledging the physical proximity of FH and Vancouver Coastal HA which has a Stroke Prevention Clinic at Vancouver General Hospital).

² To maximize coverage, the plan is to stagger clinic openings and to have at least one open in FH Monday to Friday. This will be particularly important for FE where clinic hours and volumes will be less.

Table 2: FH TIA/Stroke Prevention Clinic Hours/Half-Days per Week, 2008 - 2020

	Projected TIA/Stroke Prevention Clinic Half-Days per Week				
	Clinic Capture Rate for Out-patient Care				
	40%	50%	60%	60%	60%
	2008/09	2009/10	2010/11	2015	2020
FE	2	3	4	4	4
FN	4	5	6	7	7
FS	5	6	7	8	9
Total, FH	11	14	17	19	20

FH TIA/Stroke Prevention Clinic Budget

One-time costs are anticipated to be \$170,000 (all in 2008/09). Ongoing costs will be \$195,000 in 2008/09 (6 months of operation), \$450,000 in 2009/10, with a gradual increase as the population and number of visits increases.³ See Table 3.

Table 3: FH TIA/Stroke Prevention Clinic Hours/Half-Days per Week, 2008 - 2020

Clinic	2008/09			2009/10	2010/11	2015	2020
	One-time	Ongoing	Total	Ongoing	Ongoing	Ongoing	Ongoing
FE	\$48,571	\$38,588	\$87,159	\$91,014	\$105,319	\$112,207	\$118,793
FN	\$60,571	\$82,163	\$142,734	\$187,994	\$212,806	\$226,348	\$239,129
FS	\$59,571	\$73,759	\$133,330	\$174,902	\$203,332	\$218,128	\$232,415
Total	\$168,713	\$194,510	\$363,223	\$453,910	\$521,457	\$556,683	\$590,337

³ Costs do not include costs for clinical time for the neurologists. Costs assume that clinical time will be billed on a fee-for-service basis. If this is not feasible and an alternative payment billing mechanism is required, additional funding will be required.



Date: March 7, 2008

PREPARED FOR:	Provincial Stroke Strategy
TOPIC:	TIA Rapid Assessment/ secondary prevention clinics

ISSUE: The best practices literature for stroke care is clear that rapid assessment and treatment of minor stroke and TIA is required to prevent the debilitating effects of stroke for some people. While VIHA has taken a leadership role in establishing a collaborative framework for stroke care throughout the health region and in the province, the literature and VIHA data indicates that rapid assessment and triage of TIA and mild strokes can be further enhanced.

OBJECTIVE: To improve timely access to diagnosis and treatment for minor stroke and TIA patients on Vancouver Island. This includes increasing the number of TIA and minor stroke patients seen and the assessment of patient's closer to home. Assessment needs to be completed in a timely fashion, ideally within 48-96 hours.

SCOPE: Geographic equity of service is a component of the VIHA strategic plan. This proposal enhances the services currently offered in Victoria by utilizing process improvement methods and increasing capacity. The North Island and Comox Valley will reorganize current service into an out patient clinic format that will provide rapid access and secondary prevention to the minor stroke and TIA population. By promoting 2 centers of service for a large geographic area consideration is given to the time for travel, the elderly, and aboriginal population needs. A collaborative model of service will be implemented and the Stroke Rapid Assessment Unit (SRAU) in Victoria will continue to remain the "hub" of TIA care and triage on the Island.

BACKGROUND:

- 1,086 patients were admitted for stroke in VIHA in 2006-07 of which 89% were admitted through the Emergency Departments. The average age is 73.
- Victoria General Hospital admitted and discharged 329 stroke patients and 45 TIA patients in 2005-06.
- Campbell River Hospital admitted and discharged 40 stroke patients and 20 TIA patients in 2005-06.
- The number of carotid endarterectomy procedures for stroke and/or TIA symptoms was 196 patients in 2005-6.
- Registry data collected in 2002 showed that 67% of cerebrovascular patients presenting to Victoria emergency rooms were TIAs or mild strokes i.e. they could be cared for in an ambulatory environment.
- Published data shows that TIAs have a high rate of deterioration in the short term: 5% having a major stroke within 48 hours, 10% within 90 days, 10% within a week if from a carotid source. TIA is now being recognized to be as dangerous or more so than acute coronary syndrome.

- Two papers in Lancet Neurology in November 2007 substantiate this level of impact. Units built in Oxford and Paris at the same time as ours both demonstrated an 80% reduction in stroke over 90 days amongst TIA patients managed rapidly in centralized units.
- Data from the Oxford experience applied to the VIHA population would translate into 50 strokes prevented per year.

DESCRIPTION:

- Most TIA patients receive their diagnostic work-up on an out-patient basis. 905 patients were seen in the in Victoria unit in 2006, of which about 70% were confirmed to have experienced a TIA or mild stroke.
- Investigations previously done as in-patients are now done as out-patients, generating revenue for the hospital (606 Ultrasound and 726 CT scans in 2006).
- There are fewer admissions for minor stroke (observational data from the Neurosciences Unit, VGH).
- The services provided by the SRAU in Victoria are well received by the ER physicians within VIHA. Physicians throughout the Island indicate that the SRAU is a valuable service and about 1/2 of all patients seen reside outside of Greater Victoria.
- The SRAU is currently open 4 days per week.
- Consideration needs to be given to provide service to patients in the Central and North Island in collaboration with Victoria.
- A different model of care from the Victoria Unit will be implemented due to the lack of Neurologists in the Centre and North Island.
- An RN and Internal Medicine physician will staff the clinic for the North Island to provide services for patients from Campbell River, Comox, and Courtenay. The patient population will be TIA and minor strokes. Once the service is available Tele-health will be an option for referring to the neurologists in the Victoria or the rest of the province. The clinic will be based on a self-management model with patient assessment, treatment, goal setting and referral to community resources. Phone follow up will occur for medication compliance especially when no GP is involved in care. This model will include lifestyle management and medication education. The RN will coordinate stroke care and develop new programs for the North Island and Comox valley in collaboration with the stroke program in Victoria. Clerical support is required and will include monitoring of outcome data.
- Development of a nurse practitioner (NP) role for triaging and follow up of TIA patients will assist with access and flow. The NP would have the ability to prescribe and follow up with certain medication regimes.

REQUEST:

- Nursing and clerical funding to operate the Victoria clinic 5 days / week. 0.85 FTE clerical (includes 0.05 relief) and 0.3 FTE Nursing (includes 0.03 FTE relief). This could be implemented immediately.
- Nursing and clerical funding to open a clinic in the North Island. 1.0 FTE RN DC2 and 0.54 FTE clerical. The nurse will oversee the continued development of the stroke program and follow patients to reduce the impact of their stroke or TIA on their lifestyle and overall health. This out-patient clinic could be open by June 08
- One time funding for a lean design process to review the current throughput and function of the Stroke Rapid Assessment Unit in Victoria. Completion by July 08.

- Stipend for the Medical director of the SRAU to oversee program development, outcome monitoring, and quality assurance on an island wide basis.
- 0.2 FTE IM/IT support to enhance the existing database and to provide an Island wide data collection and monitoring process.
- 1.0 FTE stroke nurse practitioner to coordinate care throughout the Island. Recruitment could begin immediately.

EVALUATION:

- Improved level of out-patient services will reduce the need for in-patient admissions and assist with access and flow of acute care beds.
- Outcome measures could include; Volume of patients seen, volume of patients referred for carotid endarterectomy, volume of patients admitted to in-patient beds with diagnosis of minor stroke/TIA, and time from Emergency or Physician visit for mild stroke / TIA to clinic assessment.

BUDGET:

Location	Staffing	Cost
SRAU, Victoria	0.30 FTE DC1	\$ 19,000
	0.85 FTE Clerical	\$ 32,400
Campbell River	1.0 FTE DC2	\$ 74,000
	0.54 FTE Clerical	\$ 20,600
Medical Director Stipend.	Sessional fee	\$ 12,000
Lean design process	Facilitator, sessional dollars and staff replacement.	\$ 10,000
Nurse practitioner	1.0 FTE DC3	\$ 77,000
IM/ IT support	0.2 FTE	\$ 22,000
Supplies		\$10,000
Total		\$ 277,000

PREPARED BY:

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Project Name: **TIA Rapid Assessment/Secondary Prevention Clinic**
Project Purpose: **Improve Access to TIA Rapid Assessment**
Submitted to: **Provincial Stroke Steering Committee**
Date: **April 4, 2008**

Project Description:

The purpose of this proposal is to introduce systematic changes at a regional level that will increase access and shorten wait times to specialized assessment for patients who have experienced a transient ischemic attack (TIA). Specifically, the project will provide patients who have had a TIA or minor stroke more efficient access to necessary diagnostic testing and treatment.

The scope of the proposal involves systematic change at three (3) hospital sites in Vancouver Coastal Health (VCH): Vancouver General Hospital (VGH), Lions Gate Hospital (LGH), and St Paul's Hospital (SPH), with linkages to all community and rural institutions in VCH. This proposal provides a health authority wide approach designed to increase timely patient access to necessary TIA treatment and diagnostic testing. Best practice outlines that at a minimum diagnostic testing should include basic blood testing, an electrocardiogram, and an urgent CT Scan. Carotid imaging should be performed urgently as well. Current guidelines also support the rapid administration of antiplatelet treatment, anticoagulant treatment for patients with atrial fibrillation, and if necessary antihypertensive agents and anti-lipid agents.^{1 2 3} Three different models to improve patient access, and the related resource requirements, are presented for three sites across the region: VGH, LGH and SPH.

Background and Current Situation:

Site capacity to deliver rapid access functions varies throughout VCH. At VGH, there is a secondary prevention clinic with designated geographic space that operates three days per week (all day Wednesday, and half days on Tuesday and Friday), with two stroke neurologists. To maintain rapid access, patients are seen during clinic hours on their first visit only; if a follow up visit is required, the stroke neurologist sees the patient in their private office. The clinic's patient volume is increasing over time. From April 1, 2007 to February 7, 2008 the clinic saw 1350 new patients, which is an increase from the patient count of 1180 during the same time period in FY 06/07. Patients who are referred to the clinic reside in areas across the lower mainland and outside the health authority. A chart review of data collected between September 28, 2007 and December 18, 2007, indicates that 38% of patients reside in the Vancouver, while 62% are from outside Vancouver. A more in-depth analysis reveals that many patients are from Fraser Health Authority: 5% from Langley, 11% from Surrey, and 8% from Burnaby. Patient referrals come from Emergency Departments (ED), specialists and family physicians. Referral data compiled from September 28, 2007 to December 18, 2007 shows that approximately 65% of patients are from family physicians, 20% are from specialists, 15% are from ED. The average wait time from referral to when the patient is seen in the clinic is 15.47 days.

At LGH, an organized system has been developed that allows two stroke neurologists to see patients from the suburban North Shore region and throughout the rural coastal region in their private offices. Patients from North Vancouver, Squamish, Whistler, Sechelt, and other coastal sites are scheduled to see the neurologist for diagnostics and treatment, within approximately 72 hours of referral, on any of the week. Diagnostic assessments are generally completed within the week that the patient is referred. There are approximately six patients seen by the neurologists each week. Either an ED physician, or a General Practitioner (GP) from the coastal sites refers patients to diagnostic testing and treatment at LGH. For the rural and coastal communities, establishing a formal link between GPs and the stroke neurologists is essential to ensuring that patients receive timely access to necessary treatment.

SPH sees patients referred from the EDs of St. Paul's site and MSJ sites, as well as patients referred from GP's offices both within and outside the region. The Rapid Access Neurology Clinic serves as an urgent referral clinic for patients with a variety of cerebrovascular problems, both symptomatic and asymptomatic. A formal audit has not been performed in the clinic. Patients are referred to the Rapid Access Neurology Clinic, on site, to be seen on Tuesday mornings (4 clinic appointments are held for TIA patients). Additional appointments are arranged as needed. Due to increasing volumes, this model has been problematic because the Rapid Access Neurology Clinic often is booked with non-TIA patients, and wait times have increased. While it is not ideal, the 'spill-over' mechanism currently in place involves the ED physician phoning the on-call neurologist to arrange an urgent appointment, external to the Rapid Access Neurology Clinic. As with many sites in VCH, adherence to the best practice guideline of assessment within 48 hours post-TIA has been difficult at SPH.

Objectives:

The regional objectives of the project are:

- Improve patient access to diagnostic testing and specialist access: majority of all referred patients seen within 48 hours.
- Increase capture for all TIA patients in the region to 80%.
- Support primary care physicians.
- Decongest Emergency Departments.
- Reduce disability and death within the region by improving secondary prevention for patients with TIA.

Description of Site-Specific Plans to Improve Rapid Access:

Improving rapid access at the VGH stroke prevention clinic requires that the clinic be open an additional 1 to 1.5 days per week. The resource requirements to do this involve increasing the current nursing staff to a full-time position. The nurse's daily tasks will include triaging and screening patients, pre-booking diagnostic tests, as well as engaging in patient education and conducting telephone follow-ups with patients. The VGH clinic is established with well-functioning processes and links to the diagnostic imaging department, therefore the time needed to implement a pilot project involving additional nursing support would be minimal. The impact of additional funding would increase the number of patients seen in the clinic by approximately 30 to 45 patients per week.

As a key link to VCH's coastal communities, LGH can improve access for patients in these areas by developing, maintaining and strengthening a formalized link with GPs in the coastal region. A part-time nurse would perform an education and relationship establishment function that would include disseminating information to GPs regarding appropriate TIA diagnosis and treatment, and creating a formal link between GPs and neurologists at LGH. This also includes developing standardized protocol forms that GPs would send directly to the LGH neurologist office, which would increase efficiency with expediting necessary assessments. The nurse would also be responsible for consistent data monitoring, to evaluate the program and make improvements. By increasing education and streamlining the referral process, patients residing in rural areas will have more equitable access to timely assessment and treatment. While formal links are currently established between LGH neurologists and GPs, this proposal involves enhancing the current system to reach a broader network of GPs and patients.

At SPH, the plan to improve patient access is two-fold and targets those patients presenting to the ED, as well as in GP offices. First, by creating a TIA/minor stroke pathway for the existing Diagnostic and Treatment Unit (DTU) in the ED, patients who present with stroke-like symptoms requiring further investigation and consultation by a neurologist can be held in the observation unit of the ED, and receive expedited investigations and treatment as well as a period of observation, decreasing the need for admission to hospital. The attending stroke neurologist will assess patients in the DTU within 24 hours, at which time the neurologist will decide on further treatment, admission or discharge to hospital. This process will front-end load the investigations and offers a cost-effective and safe alternative to high-risk TIA patients. The infrastructure for this proposal is already in place and start-up costs would be minimal. The Stroke and TIA-specific clinical pathways and protocols are being developed now. Funding is being sought for support to book tests, organize follow-up visits with the patient's GPs, and audit effectiveness. The second component of the SPH plan is to improve access for those patients who do not present in the ED, as these patients often have greatest barriers to timely assessment. This population differs from the ED population in that they may have significant risks for stroke, but may not have had symptoms (i.e., a TIA). For example, they may have been identified to have carotid artery stenosis, atrial fibrillation or multiple vascular risk factors. The plan is to re-dedicate a half-day per week exclusively to this group of patients, with the option of expanding further, depending on demand. Funding is being sought for a nurse to perform initial assessments as well as organize and book further testing and consultations as needed.

The proposals for each site would be developed as pilot projects. These pilot projects require further development of site-specific pre-post evaluation strategies to measure the impact of additional resources. Measurable outcomes that will be compared through pre-post evaluation strategies include patient volumes and average wait-times. Evaluation strategies will also include enhancing existing data systems and data capture methods. The expectation is that with measurable improvements in access and timely care, funding for these initiatives will be provided on a permanent basis.

Impact and Benefits:

While accurate estimates of the burden of TIA and minor stroke in VCH are not available at the present time, estimates derived from current population-based estimates in published literature provide an insight into impact.⁴ VCH's population is approximately 1.1 million; therefore, applying a population-based estimate from literature, the estimated incidence of TIA and mild stroke for the

region is approximately 1,848. This is a conservative estimate, however, because as stated above an estimated 25% of patients seen in VCH clinics reside in Fraser Health Authority, and another proportion are from other health regions and outside the province. Assuming a 'capture rate' of 75% (where 75% of all patients would be seen in a secondary prevention clinic), VCH would have at minimum 1,386 TIA and minor stroke patients.⁵ Expecting a mimic rate of 42% (meaning 42% of referred patients have not actually had a TIA or minor stroke), the total volume of patients seen would be 1,968. Evidence from regions who have instituted rapid TIA assessment protocols has shown a reduction in the incidence of subsequent stroke after TIA **by 80%**.⁶ With coordinated, rapid care in VCH, as outlined in this proposal, this could amount in the prevention of, at minimum, 100 strokes per year.

Summary of Resource Requirements:

VGH	
PERSONNEL COSTS:	
• 1 FTE Nurse (1 year timeline)	\$60,669.00
EVALUATION COSTS:	
• Research assistant audit (weekly audit / all patients) – database development, data entry (1 year timeline)	\$8,000.00
Subtotal for VGH	\$68,669.00
LGH	
PERSONNEL COSTS:	
• .6 PT Nurse (1 year timeline)	\$36,401.00
OPERATION COSTS:	
• Develop TIA Protocol and Education Plan for GPs	\$5,000.00
• Travel costs to rural sites	\$5,000.00
EVALUATION COSTS:	
• Research assistant audit (weekly audit / all patients) – database development, data entry (1 year timeline)	\$8,000.00
Subtotal for LGH	\$54,401.00
SPH	
PERSONNEL COSTS:	
• .6 Nurse	\$36,401.00
• Physician / Nursing Education	\$2,000.00
OPERATIONAL COSTS:	
• Development of TIA / Minor stroke DTU pathway:	
□ Order set development (ED, Neurology, Radiology input)	\$5,000.00
□ Input of order sets into physician order entry program (SCM)	\$5,000.00
EVALUATION COSTS:	
• Research assistant audit (weekly audit / all patients) – database development, data entry (1 year timeline)	\$8000.00
Subtotal for SPH	\$56,401.00
Total	\$179,471.00

¹ Sacco RL, Adams R, Albers G, Alberts MJ, Benavente O, Furie K, Goldstein LB, Gorelick P, Halperin J, Harbaugh R, Johnston SC, Katzan I, Kelly-Hayes M, Kenton EJ, Marks M, Schwamm LH, Tomsick T; American Heart Association; American Stroke Association Council on Stroke; Council on Cardiovascular Radiology and Intervention; American Academy of Neurology. Guidelines for prevention of stroke in patients with ischemic stroke or transient ischemic attack: a statement for healthcare professionals from the American Heart Association/American Stroke Association Council on Stroke: co-sponsored by the Council

on Cardiovascular Radiology and Intervention: the American Academy of Neurology affirms the value of this guideline. *Stroke*. 2006;37:577–617.

² Update to the AHA/ASA Recommendations for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack Robert J. Adams, MS, MD, FAHA, Chair; Greg Albers, MD; Mark J. Alberts, MD, FAHA; Oscar Benavente, MD; Karen Furie, MD, MPH, FAHA; Larry B. Goldstein, MD, FAHA, FAAN Philip Gorelick, MD, MPH, FAHA, FAAN; Jonathan Halperin, MD, FAHA; Robert Harbaugh, MD, FACS, FAHA; S. Claiborne Johnston, MD, PhD; Irene Katzan, MD, MS, FAHA; Margaret Kelly-Hayes, RN, EdD, FAHA; Edgar J. Kenton, MD, FAHA, FAAN; Michael Marks, MD; Ralph L. Sacco, MS, MD, FAHA, FAAN; Lee H. Schwamm, MD, FAHA *Stroke*. 2008;39:000-000.

³ Canadian Stroke Network and the Heart and Stroke Foundation of Canada: Canadian Stroke Strategy. Canadian Best Practice Recommendations for Stroke Care: 2006. Ottawa, 2006.

⁴ Rothwell PM, Coull AJ, Silver LE, Fairhead JF, Giles MF, Lovelock CE, Redgrave JN, Bull LM, Welch SJ, Cuthbertson FC, Binney LE, Gutnikov SA, Anslow P, Banning AP, Mant D, Mehta Z. Population-based study of event-rate, incidence, case fatality, and mortality for all acute vascular events in all arterial territories (Oxford Vascular Study). *Lancet* 2005 November 19;366(9499):1773-83.

⁵ Data based on Vancouver Island Health Authority's (VIHA) Stroke Prevention Clinic volume data.

⁶ P. Rothwell, M. Giles, A. Chandratheva, L. Marquardt, O. Geraghty, J. Redgrave, C. Lovelock, L. Binney, L. Bull, F. Cuthbertson. Effect of urgent treatment of transient ischaemic attack and minor stroke on early recurrent stroke (EXPRESS study): a prospective population-based sequential comparison. *Lancet* 2007, Volume 370, Issue 9596, Pages 1432 – 1442

NORTHERN HEALTH AUTHORITY REQUEST FOR FUNDING PROPOSAL SUBMISSION TIA RAPID ASSESSMENT

PREPARED BY: JACQUIE SCOBIE, RN. MA – JS CONSULTING
ON BEHALF OF: RUBY FRASER - REGIONAL DIRECTOR QUALITY AND RISK MANAGEMENT

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BACKGROUND:

Northern Health's involvement began in the winter of 2007 with initial discussions and contract development between Ruby Fraser, Regional Director Quality and Risk Management and Jacquie Scobie RN, MA, JS Consulting. With executive endorsement, the project began with the secondment of clinical lead, Rita Sweeney, RN with expertise in emergency and critical care September 1, 2007.

From existing NHA 2006 Current Practice Indicator Report (CPIP) data, additional site visits and chart audits, delays in access to assessment, diagnostic imaging and transfer capacity/availability have been found to impact patient outcomes. In the brief time our project team has been working with this provincial initiative we have been successful in identifying gaps in practice, access to treatment and appropriate management of TIA/Stroke patients. These gaps are trended as inconsistent practice and documentation. Additional factors include geographic implications, maintenance of competence and human resource capacity. Critical mass does not always support the capacity to keep key medical support in smaller facilities so access to video or teleconferencing is very important to assist decision making process for transfer or appropriate treatment or follow up interventions.

Significant strengths have been recognized as well and these strengths include a commitment and willingness of health authority wide professionals to participate in a quality initiative to address the variability of access to rapid assessment for patients who have experienced a TIA within our health authority. In order to improve timely access to services, we will participate in an active collaborative model to identify key processes and engage in effective change management across the three health service delivery areas (HSDA) in the NHA.

OBJECTIVE:

Our objective in this initiative will be to continue to assess and implement processes that will support timely access to services such as initial identification, diagnostics, tracking and appropriate follow up or referral patterns. Need for transfer for care or preventative interventions will be identified. Analysis of geographic factors will continue with exploration of strategies to mitigate these implications.

SCOPE:

We have been successful in identifying and including key stakeholders across the health authority to participate in a collaborative TIA/Stroke Steering Committee. This steering committee has provided a forum for discussion specific to the TIA/Stroke Protocols as well as supporting our clinical lead. This committee will steer the direction of engagement and provide linkages between services.

The scope of our work to date has included all three health service delivery areas, and will continue to, while going forward. In addition to the acute care providers, inclusion of primary care coordinators from Care North are involved given their pillar related to prevention.

This proposal includes resources to support with reorganization of the system and/or processes and assistance with education and training for health care providers. It also will require resources to assist a physician champion to work collaboratively with a coordinator and provide leadership to the team.

DESCRIPTION OF WORK/TASKS:

- Recruitment of coordinator to provide direction and guidance across Northern Health
- Recruitment of educator/trainer to assist with meeting needs of health care providers
- Continued support of the steering committee, which includes representation from Neurology, Emergency Department, Diagnostic Services, Telehealth, BCAS, Care North.
- Identification of Physician Lead/Champion:
- Continued collaboration with all stakeholders in each of the HSDAs to determine areas of improvement for timely access to services.
- Inventory of current diagnostic tests, capacity and availability at each facility including waitlists.
- Inventory of current referral patterns and barriers to access to additional services for referral.
- Consensus around revisions to triage algorithms and order sets.
- Education and training for algorithms and order sets.
- Implementation of consistent practice in the use of algorithms and order sets.
- Development of documentation forms for practice and evaluative processes.

KEY INDICATORS/EVALUATIVE PROCESSES:

The CPIP data will provide guidance to the stakeholders as they identify key parameters or service targets in the measure of timely access to services, care delivery and appropriate management. For example, a key target already identified by the steering committee is the # of diagnostics available across the NH, specifically Carotid Ultrasound capacity and associated waitlists.

BUDGET:

April 1, 2008 to September 30, 2008

Description of project needs	Costs
Personnel:	
• Project Lead	10,000.00
• Coordinator	50,000.00
• Educator	25,000.00
• Research Support	12,500.00
• Physician Champion	20,000.00
Education and training	30,000.00
NH TIA/Stroke Steering Committee meetings	12,500.00
	\$160,000.00