

BC Stroke Strategy

Regional Stroke Action Plan

Appendix E – Vancouver Island Health Authority

Acknowledgements & Contributions

At the request of both the Ministry of Health Services and the health authorities, the Heart and Stroke Foundation of BC & Yukon has lead the BC Stroke Strategy (BCSS) initiative over the last five years, working in partnership with agencies and organizations representing those involved in stroke prevention and treatment and advancing the planning and prototyping phases for a number of priority areas, some of which are incorporated in this provincial plan.

The BCSS would like to acknowledge all the organizations and individuals who contributed to this work. Key contributors involved in the development or review of the Stroke Action Plan include but are not limited to the following:

Organization	Representative
Heart and Stroke Foundation of BC & Yukon	<ul style="list-style-type: none"> Mark Collison – BCSS Lead Diego Marchese – Executive Advisor
BCSS Core Team	<ul style="list-style-type: none"> Diane Layton – BCSS Project Manager Dr. Allan Holmes – ACVS Medical Consultant Laura Reeves – ACVS Project Manager Dr. Hans Krueger – Metrics and Data Modeling Helen Truran – Telestroke Clinical Lead Mary Stambulic – BCSS Administrative & TeleLearning Coordinator
Clinical Experts	<ul style="list-style-type: none"> Dr. Philip Teal – VCH Dr. Kennely Ho – FH Dr. Andrew Penn – VIHA Dr. Devin Harris – Providence Dr. Dean Johnston – Providence Dr. Todd Collier – IH Dr. Jacqueline Pettersen – NH Dr. Graydon Meneilly – VCH Dr. Jennifer Yao – VCH
Ministry of Health Services – Health Authority Division	<ul style="list-style-type: none"> Brenda Canitz (CCM / KRA) Liv Brekke (CCM / KRA) Leigh Ann Sellers Munjeet Bhalla Alex Scheiber
Ministry of Health Services – Medical Services Division	<ul style="list-style-type: none"> Dr. Dean Kolodziejczyk
Ministry of Health Services – Primary & Community Care Division	<ul style="list-style-type: none"> Val Tregillus Darcy Eyres
BC Ambulance Service	<ul style="list-style-type: none"> Dr. Karen Wanger
Fraser Health	<ul style="list-style-type: none"> Barbara Korabek – Exec Sponsor Susan Brown – Exec Sponsor Michelle deMoor – Stroke Lead until spring 2010 Heather Mash – Current Stroke Lead Kevin Harrison – Regional Stroke Coordinator
Vancouver Coastal Health	<ul style="list-style-type: none"> Dr. Patrick O'Connor – Exec Sponsor Dr. Jeff Coleman – Exec Sponsor Donna Stanton – Exec Sponsor Lisa Hoefer – Stroke Lead until Spring 2010 Dixie Butts – Current Stroke Lead
Vancouver Island Health	<ul style="list-style-type: none"> Dr. Allan Meakes – Exec Sponsor Marilyn Copes – Exec Sponsor Dr. Wayne Shtybel – Regional Medical Lead Leighanne Mackenzie – Stroke Lead until summer 2010 Robert Crisp – Current Stroke Lead
Interior Health	<ul style="list-style-type: none"> Darlene Arsenaault – Exec Sponsor Lori Seeley – Current Stroke Lead
Northern Health	<ul style="list-style-type: none"> Dr. David Butcher – Exec Sponsor Rita Sweeney – Current Stroke Lead Ruby Fraser – Exec Sponsor
Provincial Health Services (PHSA)	<ul style="list-style-type: none"> David Babiuk – PHSA Janis McGladrey – PHSA

Key messages / products of various working groups of the BCSS have been incorporated into this Provincial Plan. These groups include the following:

- The ACVS Clinical Consensus / Expert Group
- The ACVS Advisory Group
- The joint MoHS / BCSS Measurement & Evaluation Working Group
- The Rehabilitation and Reintegration Expert Advisory Group
- The TIA Rapid Assessment Advisory Group
- The Telestroke Advisory Group

In addition to individuals actively serving on BCSS working groups, numerous clinicians and operations managers at site levels were involved in identifying gaps in care and in strategizing on possible approaches / strategies to address these gaps. The input from these multiple sources is reflected in this Provincial Plan and detailed in the Regional Site Work Plans included in the Appendices. We would like to thank all those persons and organizations that contributed to this collaborative planning work.

Requests regarding access to Regional Appendices or to other documents referenced in this Provincial Stroke Action Plan should be directed to:

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Regional Snapshot – March 2010

VANCOUVER ISLAND HEALTH

SNAPSHOT OF STROKE SERVICES AS OF MARCH 2010

Organizational Commitment to Stroke	Current Structures to Support Stroke
<p>Strategic priorities for the organization do not include stroke at this time. Priorities include:</p> <ul style="list-style-type: none"> - transformation of the care continuum with emphasis on the elderly; - infection control, staff wellness and safety - redesign of care delivery model and staff skill mix <p>No regional strategy for changes in stroke care</p> <p>Operations priority but no dedicated resources and no “go to” person to coordinate activity</p> <p>Site specific and piece meal activity – minimal activity at a regional level</p>	<p>Quality Council supports organization-wide stroke issues. BCAS represented on Quality Council</p> <p>Telestroke Working Group disbanded at end of March 2010. Previously assumed a broader stroke issue / coordination role at NRGH and CDH</p> <p>Performance Measurement – only measures available through the Discharge Abstract Database (DAD)</p> <p>Measures from national stroke audit will be valuable to understand current state</p> <p>SRAU Clinic – outpatient data only and does not link or communicate with other VIHA systems including inpatient database</p>

Comprehensive Stroke Centres	Regional Stroke Centres	Primary Stroke Centres
<p>Tertiary centre providing a full range of services including neurosurgical/radiological interventions and rehabilitation</p> <p>Victoria General Hospital</p>	<p>Regional hospital providing CT, tPA, Telestroke links to Comprehensive Stroke Centre</p> <p>Nanaimo Regional General Hospital</p> <p>Cowichan District Hospital</p>	<p>Provides CT, tPA and organized emergency care, links to Regional and Comprehensive Stroke Centres</p> <p>Campbell River and District Hospital</p> <p>St. Joseph’s General Hospital</p> <p>Royal Jubilee (by-pass protocol to Victoria General Hospital but able to manage tPA)</p> <p>Saanich Peninsula (by-pass protocol to Victoria General Hospital; not able to manage tPA)</p>

Current Emergency and Inpatient Focus		
Pre-hospital	Emergency	Inpatient
<p>By-pass protocols more relevant in Victoria / Sidney area (Saanich Peninsula and Royal Jubilee patients diverted to Victoria General)</p> <p>Only one main road for Central and Northern Vancouver Island</p> <p>TIA / Rapid Assessment Clinics in Victoria and Campbell River</p>	<p>Standards in place for tPA</p> <p>Order sets ready. Initial education and implementation complete. Ongoing education or assessment of compliance not in place</p> <p>Currently neurologist support VIHA sites via telephone for all sites and Telestroke at CDH and VGH</p>	<p>Each site working on care pathway for stroke care (PDSA cycles – collaborative work initiated with Diana Foster)</p> <p>Victoria General – cohort of eight beds on 5B for stroke rehabilitation. The 45-bed neuroscience unit (6 south) includes medical and surgical neuro patients. Highest LOS – double the standard. Considering designating stroke recovery beds</p>

Current Emergency and Inpatient Focus (continued)

Pre-hospital	Emergency	Inpatient
		at Aberdeen Campbell River – cohort of four beds and implementing best practices. Strong role model for other centers Nanaimo – some cohorting of beds on the fourth floor (four beds). Shortest LOS for stroke in VIHA

Current Inpatient Rehabilitation

Comprehensive Rehab Stroke Centres	Regional Rehab Stroke Centres	Primary Rehab Stroke Centres
Victoria General Hospital (VGH) – VGH 5N: 20 bed neurological rehab unit (10 stroke beds / 10 acquired brain injury beds) – VGH 5B: 16 bed Medical/Sub-Acute Unit that has eight Neuro/Rehab beds suited for patients who require increased functional endurance prior to returning home ➤ Dedicated interdisciplinary rehab teams for 5N and 5B Neuro ➤ Access to Physiatrist onsite ➤ Access to Neurologist(s) onsite	No Regional Rehab Stroke Centres in VIHA Royal Jubilee Hospital – <i>Richmond Pavilion (RP2)</i> General rehabilitation mixed diagnosis unit and provides a small number of stroke care beds for mild stroke patients who will be discharged home	Nanaimo Regional General – 21 bed General Rehabilitation Unit serving central and north island – Mixed diagnosis rehab program – Dedicated interdisciplinary rehab team – Access to Physiatrist onsite Campbell River & District Hospital – Four-bed stroke unit – Non-dedicated interdisciplinary rehab team – Onsite Internist – No onsite access to Physiatrist – No onsite access to Neurologist

Stroke Leads / Operations Leads	Medical Leads/Stroke Specialists
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Dr. Allan Meakes and Marilyn Copes – Executive Sponsors Leighanne MacKenzie and Dr. Wayne Shtybel – Regional Stroke Leads Regional Stroke Coordinator – position vacant and not filled after departure of Diana Foster (November 2009) Sandy Drew – Operations Manager, Neurosciences VGH Heather Gibson – Manager, Neurology/Rehab Programs Kim Ezergailis – Manager Medicine Central Island Brenda Yule - Stroke Nurse Campbell River Claire Machelson (Quality Improvement Consultant)	Dr. Wayne Shtybel, Neurologist (VGH) Dr. Andrew Penn, Neurologist (VGH) Dr. Jennifer Sunderwood (CRH) Dr. Tim Deutscher, Physiatrist (NRH)
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Role Designation / Functional Capacity

VANCOUVER ISLAND HEALTH

HOSPITAL ROLES AND FUNCTIONAL CAPACITY

AS OF SPRING 2010

Note that this grid does not necessarily reflect current capacity at some of the sites but represents the role the hospital could play once all the necessary supports and systems are in place.

Current Hospital / Facility Functional Capacity for Stroke Care							
VIHA Hospitals / Facilities	CT scan	CT Tech	tPA Enabled	Neurology/ Internal Medicine	Stroke Unit/ Cohorted	Require Telestroke Support	Catchment Stroke Center
Level 1: Comprehensive Stroke Centre							
Victoria General	Y	Y	Y	24/7 Neuro	Y	N/A	Y
Level 2: Primary Stroke Centre							
Campbell River & District	Y	Y	Y	24/7 IM	Y	Part time	Y
Cowichan District	Y	Y	Y	24/7 IM	N	Full time	N
Nanaimo Regional General	Y	Y	Y	24/7 IM	Y	N	Y
St. Joseph's General	Y	Y	Y	24/7 IM	N	TBD	Y
Royal Jubilee - BYPASS ²	Bypass	Bypass	Y	Y	N	NA	N
Level 4: Non tPA Enabled Site							
West Coast General	Y	Ltd. Bypass	N	Ltd. IM	N	NA	N
Saanich Peninsula - BYPASS ³	Bypass	Bypass	N	NA	N	NA	N
Ladysmith General	N	N	N	NA	N	NA	N
Chemainus HCC	N	N	N	NA	N	NA	N
Lady Minto / Gulf Islands	N	N	N	NA	N	NA	N
Tofino General	N	N	N	NA	N	NA	N
Port Alice	N	N	N	NA	N	NA	N
Port Hardy	N	N	N	NA	N	NA	N
Cormorant Island HC	N	N	N	NA	N	NA	N
Port McNeill & District	N	N	N	NA	N	NA	N
² Royal Jubilee provides tPA for walk-ins and in hospital but is an ambulance bypass hospital due to proximity to VGH. ³ SPH is not capable to provide tPA and is a bypass hospital due to proximity to VGH.							

Stroke Management Criteria	Definitions / Scope
Telestroke	Require telehealth, clinicians and CT-associated network capabilities to support clinical processes across the stroke care continuum
CT Scan / MRI	Timely neuroimaging
Tech available	Trained techs on site
Stroke Team	Stroke team in ED; protocols for acute stroke in ED; early and appropriate acute stroke care + tPA within 3 hours; non-tPA-enabled sites have written protocols to transfer patients in timely way to the appropriate destination
Neurology / Internal Medicine	Neurology and IM support available to manage acute strokes
Neurosurgical / Neurointerventional	Medical and Diagnostic Imaging Specialists on site, available by phone or by Telestroke.
tPA enabled	Medical and diagnostic capabilities on site to enable / administer tPA.
Acute stroke pathway	Stroke pathway includes stroke order sets, patient flow processes, time-specific interventions
Bypass Protocol/Rapid Transfer	EMS transport of suspected stroke patient to most appropriate site within 3.5 hour pre-hospital time window
Stroke unit/ cohorted beds	Stroke unit or geographically designated beds; evidence-based pathways / protocols to ensure organized interventions, targeting prevention of complications and ensuring early mobilization and rehabilitation
Catchment stroke center	Facility serves a defined geographic region
Rehab	Standardized (system) screening evaluation to determine impairments and most appropriate level of rehabilitation; comprehensive rehab plan to initiate early, coordinated multidisciplinary stroke rehab, recovering movement, daily activities, communication, early discharge planning and smooth transitions
Secondary stroke prevention clinic	Stroke prevention services in a variety of settings including hospital or community-based settings
Stroke Care Monitoring and Evaluation	Routine collection of performance measures for stroke care

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Priority Themes

VANCOUVER ISLAND HEALTH REGIONAL THEMES / PRIORITIES PRIORITY AREAS OF FOCUS (ONE TO THREE YEARS)

PRIORITY	Action Plans	Major Stakeholders
General	<ul style="list-style-type: none"> Formalize regional steering committee and working groups in support of regional action plan activity Continue development of standardized tools and education / training materials Repeat national stroke care audit using same indicators to measure improvement in guideline compliance in 2012 	<ul style="list-style-type: none"> Neurosciences Medicine Rehab Community Residential
Emergency and Inpatient Care	<ul style="list-style-type: none"> Develop an island-wide community of practice to improve care and management of stroke patients with a target of reducing lengths of hospital stay Continue to roll out stroke care guidelines and standard order sets and clinical pathways for hemorrhagic and ischemic stroke 	<ul style="list-style-type: none"> Stroke Coordinator / Neurology Director Regional working group Site teams
Telestroke and tPA	<ul style="list-style-type: none"> Review of Telestroke at Cowichan District Hospital and Nanaimo Regional Hospital and assess value-add and future plans 	<ul style="list-style-type: none"> Telestroke Steering Committee Executive Director / Executive Medical Director
Secondary Prevention	<ul style="list-style-type: none"> Continue support and allocation of resources for the Stroke Rapid Assessment Units (SRAUs) in Victoria and Campbell River Improve processes for triaging patients Consider “virtual” tele-TIA support for NRGH and CDH with rapid assessment clinic 	<ul style="list-style-type: none"> Stroke Coordinator/ Primary Care Health Promotion TIA Clinic Working Group
Rehabilitation Services	<ul style="list-style-type: none"> Enhance flow of patients between care levels and expedite access to rehab support Review rehab support care as part of journey and not specific to inpatient versus community support 	<ul style="list-style-type: none"> Stroke Coordinator / Neurology Director Rehab Leads

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Resource Estimates

MODELING RESOURCE INVESTMENT REQUIRED

**Implementing Optimal Stroke Care in Vancouver Island Health
Modeling Estimated Resources Required**

	Year 1 (2011/12)	Year 2 (2012/13)	Year 3 (2013/14)	3-Year Total	Year 4 (2014/15)	Year 5 (2015/16)	Year 6 (2016/17)	Year 7 (2017/18)
<i>Cost estimates identified in this table are order of magnitude estimates based on a number of data modeling assumptions related to moving the BC health system to optimal stroke care over the next seven years, as detailed in the Provincial Plan. Modeling is based on a staged implementation approach. Actual timing of implementation will likely vary for each health authority.</i>								
Change Management Resource Requirements								
Provincial				\$0				
Regional	\$606,446	\$621,640	\$637,289	\$1,865,375	\$523,764	\$508,944	\$490,623	\$470,744
Sub-Total Change Management	\$606,446	\$621,640	\$637,289	\$1,865,375	\$523,764	\$508,944	\$490,623	\$470,744
Modeling for Optimal Care - Operational Areas								
TIA Rapid Assessment Services (1)								
Proportion of Patients Receiving Optimal Care	27.0%	30%	40%		60%	80%	80%	80%
Cost Estimate	\$0	\$2,418	\$10,761	\$13,180	\$28,121	\$46,512	\$47,908	\$49,345
Enhanced tPA Utilization / Telestroke (2)								
Activity	<i>Plan for expansion</i>	<i>Implement at 5 consulting sites</i>	<i>Implement at 9 referring sites</i>		<i>Implement at 8 referring sites</i>	<i>Ongoing operational costs</i>	→	
% Receiving tPA (assumption)	4.62%	4.62%	6.00%		8.00%	10.00%	10.00%	10.00%
Cost Estimate	\$202,306	\$291,869	\$655,957	\$1,150,133	\$734,980	\$483,437	\$484,920	\$489,631
Organized Stroke Care (3)								
Proportion of Patients Receiving Optimal Care	9.4%	25%	50%		75%	80%	80%	80%
Cost Estimate	\$0	\$457,189	\$1,224,529	\$1,681,718	\$2,037,498	\$2,258,527	\$2,326,283	\$2,396,072
Early Home Supported Discharge (4)								
Proportion of Patients Receiving Optimal Care	0%	0%	10%		20%	30%	37%	37%
Cost Estimate	\$0	\$0	\$315,177	\$315,177	\$649,265	\$1,003,114	\$1,274,289	\$1,312,517
Sub-Total Modeling for Optimal Care	\$202,306	\$751,476	\$2,206,425	\$3,160,207	\$3,449,864	\$3,791,590	\$4,133,400	\$4,247,565
Current Funding for the TIA Rapid Assessment Services ending after 2010/11	\$220,000			\$220,000				
Additional Funding to Maintain Current Capacity for the TIA Rapid Assessment Services		\$226,600	\$233,398	\$459,998	\$240,400	\$247,612	\$255,040	\$262,692
Order of Magnitude Estimate	\$1,028,753	\$1,599,716	\$3,077,112	\$5,705,581	\$4,214,028	\$4,548,147	\$4,879,063	\$4,981,000

Notes:

- (1) Optimal care associated with TIA Rapid Assessment Services is defined as access within 72 hours for 80% of TIA/minor stroke patients in the province. Optimal care is currently being provided to an estimated 27.0% of TIA/minor stroke patients living in the geographic boundaries of VIH.
- (2) Optimal care associated with tPA utilization is defined as receipt by a maximum of 10% of incident ischemic stroke patients. tPA is currently being utilized by 4.62% of the incident ischemic stroke patients living within the geographic boundaries of VIH.
- (3) Optimal care assumes that 80% of stroke patients admitted to acute care will have access to organized stroke care. An estimated 9.4% of stroke patients living within the geographic boundaries of VIH are currently receiving organized stroke care at Victoria General and Campbell River Hospitals.
- (4) An early home-supported discharge (EHSD) team is comprised of "physiotherapists and occupational therapists supported by speech therapists, physicians, nurses, and social workers whose teamwork is coordinated by regular meetings. Often the EHSD begins with one or more pre-discharge home visits, continues the day of discharge, and goes on with more home sessions per week based on a patient-held recovery plan. [However,] it should be emphasized that EHSD is not considered an alternate to a stroke unit". Larsen T, Olsen TS, Sorensen J. Early home-supported discharge of stroke patients: a health technology assessment. International Journal of Technology Assessment in Health Care. 2006; 22(3): 313-20.
The literature suggests that an average of 37% of stroke patients admitted to acute care would be eligible for EHSD. Winkel A, Ekdahl C, Gard G. Early discharge to therapy-based rehabilitation at home in patients with stroke: a systematic review. Physical Therapy Reviews. 2008; 13(3): 167-87.
No patients living within the geographic boundaries are currently receiving EHSD.
Winkel A, Ekdahl C, Gard G. Early discharge to therapy-based rehabilitation at home in patients with stroke: a systematic review. Physical Therapy Reviews. 2008; 13(3): 167-87.

INDICATORS AND METRICS

By Health Authority and HSDA

INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province as follows:

1. TIA volumes
 - Increase the volume of TIA / non-hospitalized strokes processed in TIA Rapid Assessment Clinics by **50%** between 2009/10 and 2013/14
2. tPA utilization¹
 - Increase the number of incident ischemic stroke patients appropriately receiving tPA to **10%** between 2008/09 and 2013/14
3. Incidence rate
 - Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by 10% between 2008/09 and 2013/14
4. Acute care days
 - Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay)
5. Death and dependency
 - Reduce the proportion of patients who die in hospital or are sent to a long-term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency*

The following sections include:

- trend data for Vancouver Island Health for each of these five indicators; and
- trend data for three of the five indicators (incidence rate, acute care days, and death and dependency) for
 - South Vancouver Island HSDA
 - Central Vancouver Island HSDA
 - North Vancouver Island HSDA

The majority of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry, with the exception of data for Indicator #1 which is provided by the health authorities.

¹ The original goal set prior to information on current results was 5%. Given a provincial average of 4.27%, the goal was reset at 10% in 2008/09.

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Indicators and Metrics

VANCOUVER ISLAND HEALTH INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome									
Adults* Residing in the Vancouver Island Health Authority									
2001/02 to 2008/09									
	Fiscal Year								% Change 01/02 to 08/09
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	787	747	686	750	682	700	724	692	-12.1%
Hospitalized Hemorrhagic Stroke	180	161	171	171	143	182	155	157	-12.8%
Sub-total	967	908	857	921	825	882	879	849	-12.2%
Hospitalized TIA	270	253	248	300	242	193	233	186	-31.1%
Non-hospitalized TIA/Stroke	796	864	937	968	1,050	1,109	1,196	1,230	54.5%
Sub-total	1,066	1,117	1,185	1,268	1,292	1,302	1,429	1,416	32.8%
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	3,982	4,148	4,215	4,366	4,429	4,525	4,659	4,737	19.0%
Hospitalized Hemorrhagic Stroke	762	796	852	883	890	953	974	1,028	34.9%
Sub-total	4,744	4,944	5,067	5,249	5,319	5,478	5,633	5,765	21.5%
Hospitalized TIA	1,692	1,784	1,866	1,983	2,017	2,030	2,059	2,085	23.2%
Non-hospitalized TIA/Stroke	4,911	5,291	5,714	6,160	6,641	7,157	7,733	8,233	67.6%
Sub-total	6,603	7,075	7,580	8,143	8,658	9,187	9,792	10,318	56.3%
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	0.937	0.872	0.773	0.822	0.727	0.712	0.711	0.670	-28.5%
Hospitalized Hemorrhagic Stroke	0.232	0.199	0.195	0.202	0.164	0.206	0.170	0.160	-31.0%
Sub-total	1.175	1.077	0.975	1.031	0.896	0.924	0.887	0.835	-28.9%
Hospitalized TIA	0.325	0.293	0.277	0.332	0.253	0.199	0.228	0.181	-44.2%
Non-hospitalized TIA/Stroke	1.002	1.050	1.104	1.114	1.168	1.195	1.262	1.260	25.7%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	4.515	4.573	4.522	4.546	4.472	4.416	4.403	4.342	-3.8%
Hospitalized Hemorrhagic Stroke	0.963	0.989	1.017	1.037	1.021	1.068	1.067	1.091	13.3%
Sub-total	5.478	5.562	5.539	5.583	5.493	5.483	5.470	5.433	-0.8%
Hospitalized TIA	1.933	1.979	2.008	2.073	2.043	1.988	1.950	1.906	-1.4%
Non-hospitalized TIA/Stroke	5.937	6.229	6.524	6.827	7.127	7.429	7.756	8.007	34.9%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	4.77%	2.51%	2.96%	2.12%	2.72%	2.36%	2.21%		-53.5%
365-Day Conversion Rate	6.91%	4.36%	4.70%	3.50%	4.48%	3.78%	3.43%		-50.4%
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						23	40	32	
Total Number						700	724	692	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						3.29%	5.52%	4.62%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	787	747	686	750	682	700	724	692	-12.1%
ALOS	27.29	29.61	25.17	25.16	25.73	25.28	24.66	24.80	-9.2%
Patient Days	21,481	22,121	17,264	18,867	17,547	17,693	17,851	17,159	-20.1%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	181	161	171	172	143	183	155	157	-13.3%
ALOS	22.22	20.84	23.20	24.83	18.39	26.84	18.14	15.98	-28.1%
Patient Days	4,022	3,356	3,967	4,270	2,630	4,912	2,811	2,509	-37.6%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	27.2%	26.4%	23.9%	26.9%	24.5%	24.6%	30.5%	26.7%	-1.7%
Discharged to Home	45.9%	47.3%	50.7%	49.6%	49.6%	45.6%	45.2%	47.5%	3.6%
Home with Support Services	12.5%	11.4%	10.2%	10.1%	8.4%	12.6%	10.8%	13.7%	10.2%
Continuing Care Facility	13.1%	13.0%	13.8%	12.0%	16.3%	14.7%	11.6%	10.0%	-23.8%
Other	1.4%	2.0%	1.3%	1.3%	1.3%	2.6%	1.9%	2.0%	44.7%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	48.6%	48.4%	57.3%	54.1%	45.5%	49.7%	41.9%	40.8%	-16.2%
Discharged to Home	37.0%	37.3%	31.0%	31.4%	37.8%	31.1%	47.1%	38.9%	5.0%
Home with Support Services	2.8%	4.3%	3.5%	6.4%	7.7%	4.9%	2.6%	8.3%	199.7%
Continuing Care Facility	5.0%	8.7%	7.6%	5.8%	4.9%	10.9%	5.8%	7.6%	53.7%
Other	6.6%	1.2%	0.6%	2.3%	4.2%	3.3%	2.6%	4.5%	-32.7%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	21.3%	20.5%	18.5%	21.3%	19.5%	20.7%	24.6%	22.8%	7.0%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	21.8%	21.0%	19.9%	21.7%	21.9%	18.9%	22.0%	18.0%	-17.6%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	46.7%	45.3%	54.4%	53.2%	44.8%	46.7%	41.3%	40.8%	-12.6%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	11.5%	19.3%	16.7%	15.0%	13.9%	20.6%	7.7%	6.5%	-43.7%

Grey Shading = Not Applicable/Available

* Age 20 and older

VANCOUVER ISLAND HEALTH INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following includes trend data for **Vancouver Island Health** for each of these five indicators. The majority of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry, with the exception of data for Indicator #1 which is provided by the health authorities. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment. The only exception to this is Indicator #1 in which the geographic location is based on the location of the clinic.

The focus of the graphs and charts is on provincial trends for the five key ACVS indicators.

Indicator #1 – TIA Volumes

Increase the volume of TIA/non-hospitalized strokes processed in TIA Rapid Assessment Clinics by **50%** between 2009/10 and 2013/14 (*data source*: provided by health authorities).

TIA Rapid Assessment Clinics In British Columbia by Health Authority 2009/10 Estimated		
	VIHA	BC Total
New Patients Seen	1,589	5,215
TIA/Stroke Patients Seen	1,031	2,749
Mimic Rate	35.1%	47.3%
Referral Source		
GP/Specialist	44.4%	39.1%
Emergency Department	46.0%	42.9%
Other	9.6%	17.9%
Mean Wait Time		
From Event to 1st Appointment (in days)	4.77	5.26
From Referral to 1st Appointment (in days)	3.71	4.44
# of Patients Seen Within 48 Hours	373	980
% Seen Within 48 Hours	23.5%	18.8%
<i>Note: BC total does not include data from Lions Gate Hospital in Vancouver.</i>		

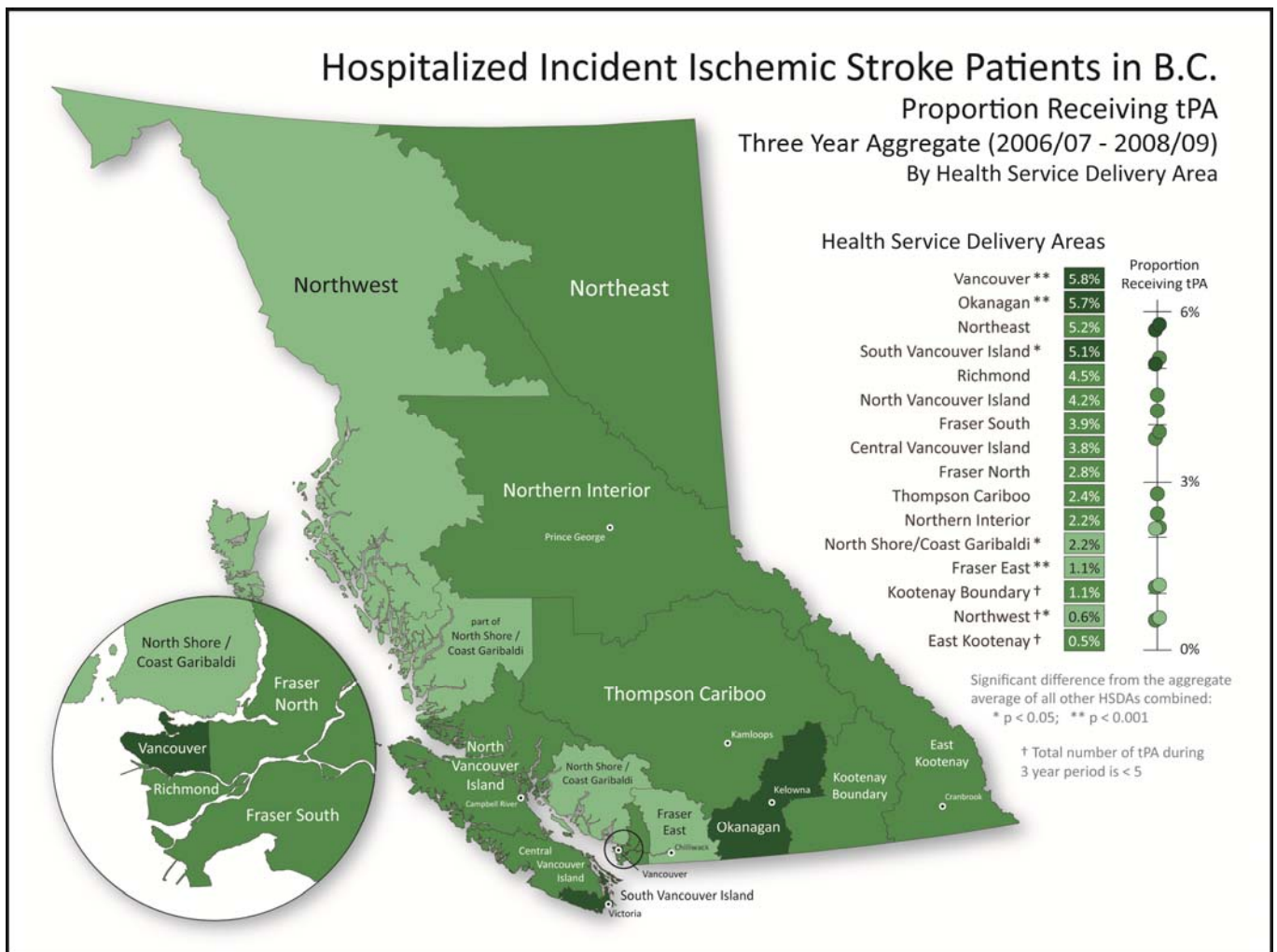
Indicator #2 – tPA Utilization

Increase the number of incident ischemic stroke patients appropriately receiving tPA to **10%** between 2008/09 and 2013/14. [Data source: proportion is based on number of incident hospitalized ischemic stroke patients (based on the updated ACVS Registry definition) with intervention code 1.ZZ.35.HA-C1 (Pharmacotherapy, total body, percutaneous approach, [intramuscular, intravenous, subcutaneous, intradermal] using antithrombotic agent). This use of this code has only been mandatory in BC since 2006/07.]

In Vancouver Coastal Health, utilization of tPA by incident hospitalized acute ischemic stroke (AIS) patients from 2006/07 to 2008/09 is as follows:

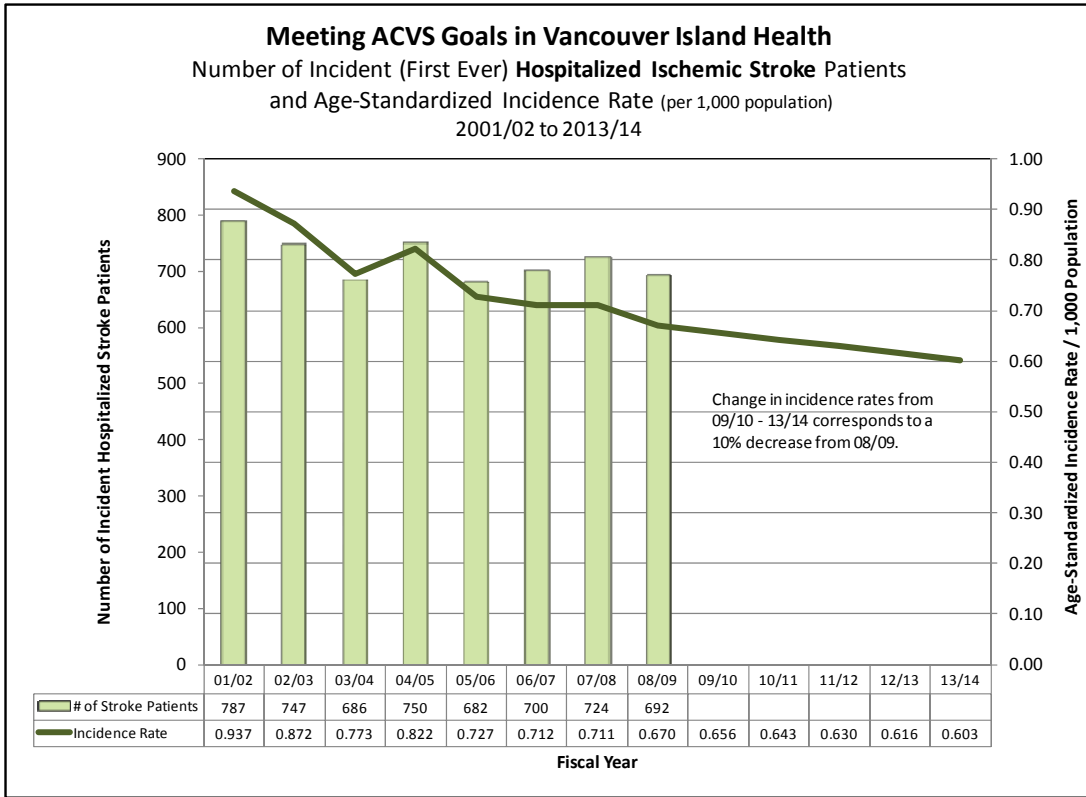
- 23 of 700 incident hospitalized AIS patients received tPA or 3.29% in 2006/07
- 40 of 724 incident hospitalized AIS patients received tPA or 5.52% in 2007/08
- 32 of 692 incident hospitalized AIS patients received tPA or 4.62% in 2008/09

In BC, there is considerable variation in use of tPA at the regional level, with a significantly higher proportion of AIS patients living in Vancouver, Okanagan and South Vancouver Island Health Service Delivery Areas (HSDAs) receiving tPA. Patients with an incident ischemic stroke living in the Fraser East, North Shore/Coast Garibaldi and Northwest HSDAs have a significantly lower probability of receiving tPA (see map below).

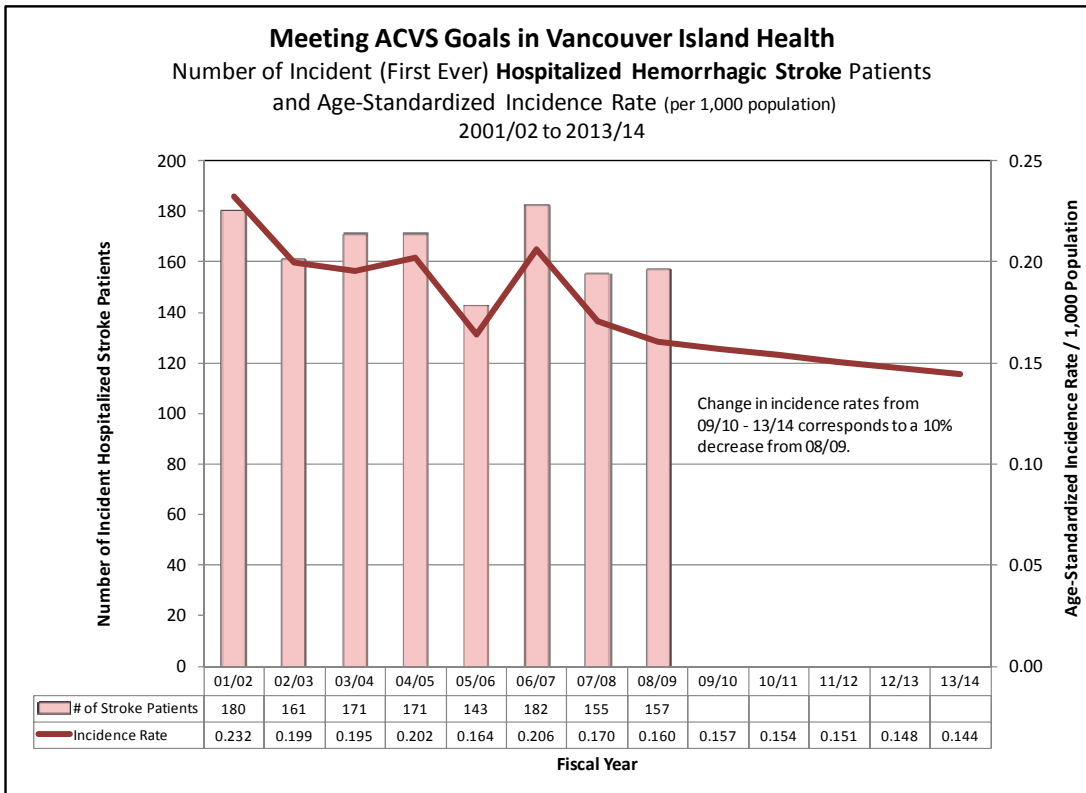


Indicator #3 – Incidence Rate

Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source*: updated ACVS Registry).



Ischemic Stroke



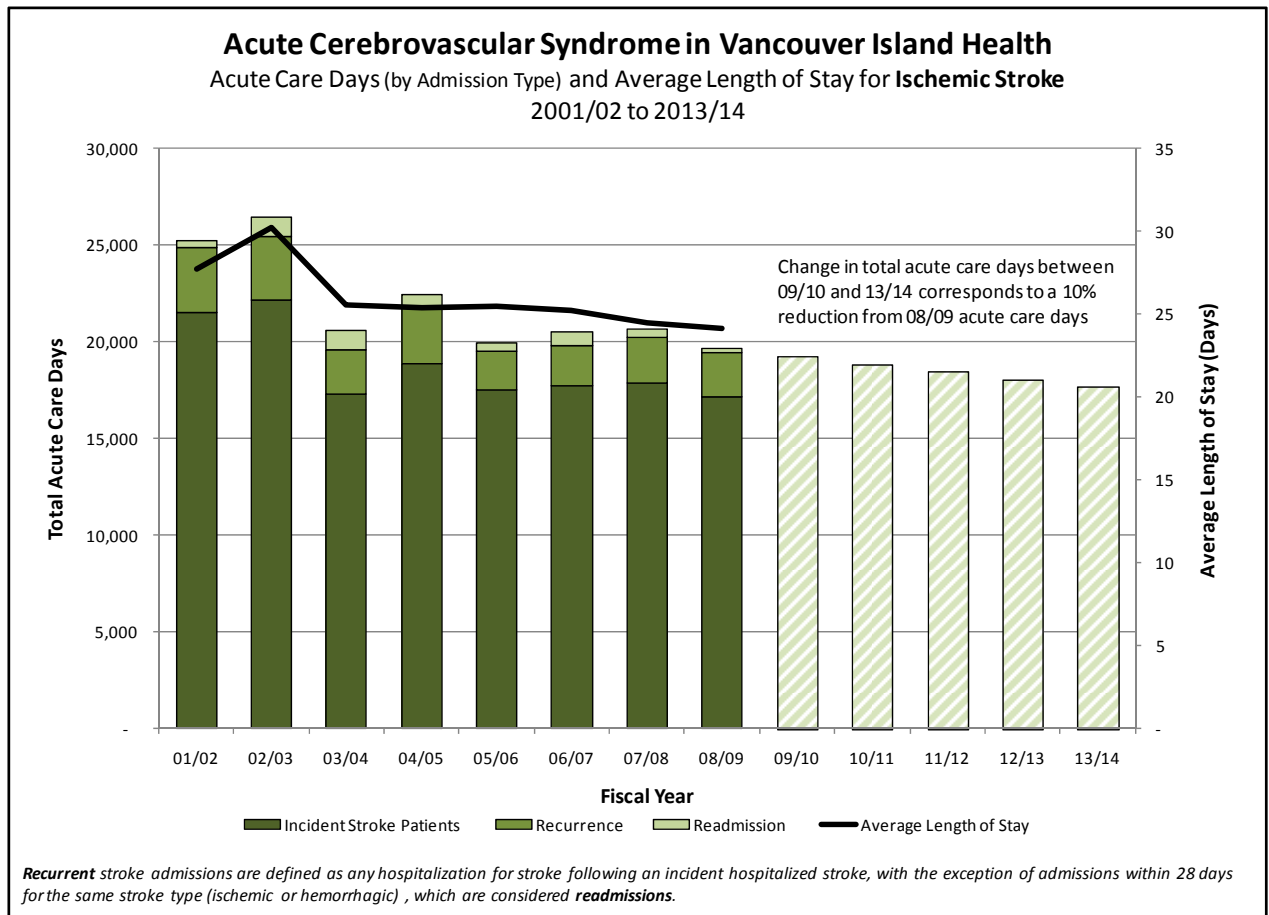
Hemorrhagic Stroke

Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

Data Source: Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Acute Care Days and ALOS for Ischemic Stroke Patients



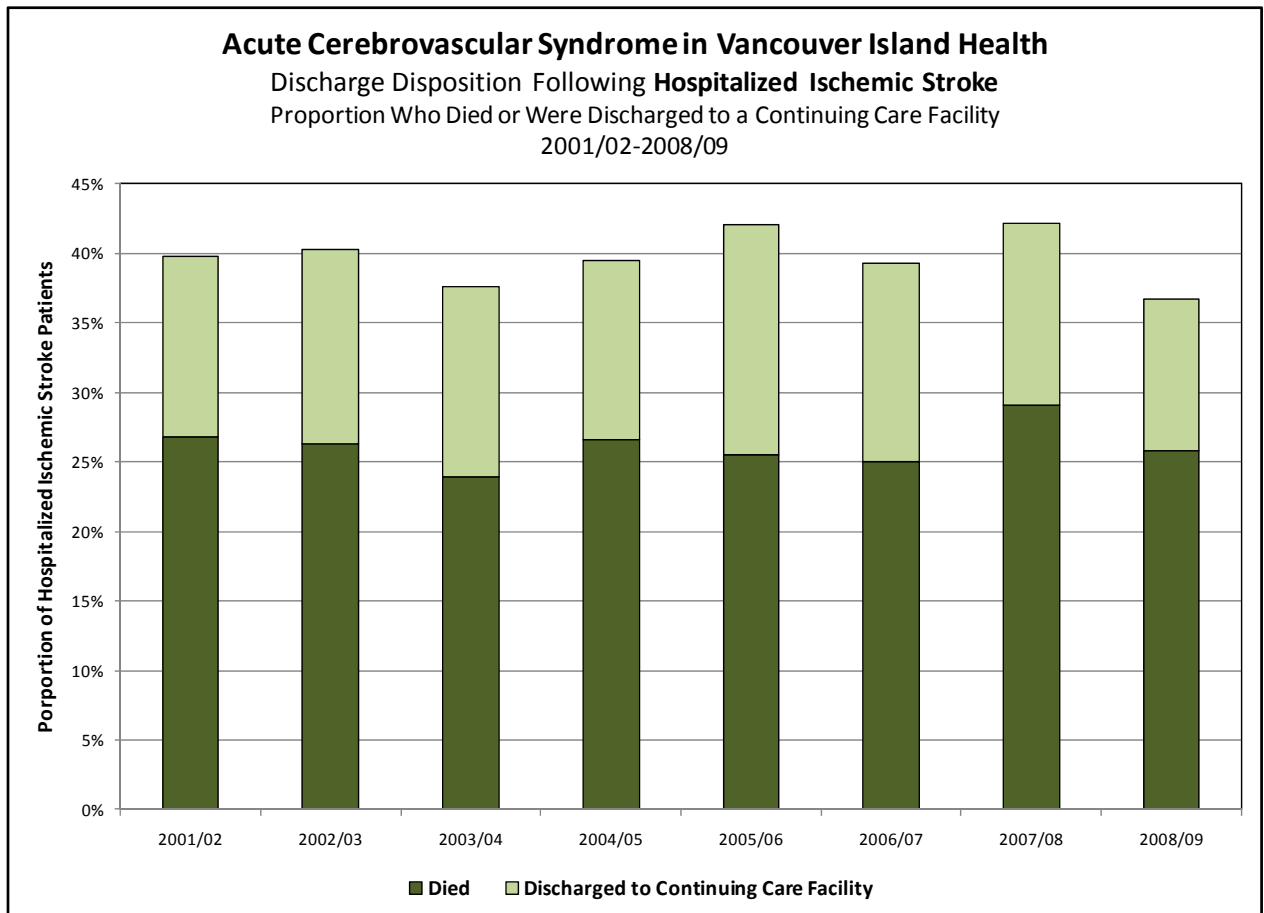
Hospitalization and ALOS for Stroke								
Adults* Residing in Vancouver Island Health Authority								
2001/02 to 2008/09								
	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	787	747	686	750	682	700	724	692
Hospitalized Hemorrhagic Stroke	181	161	171	172	143	183	155	157
Readmission								
Hospitalized Ischemic Stroke	12	16	18	17	7	15	12	20
Hospitalized Hemorrhagic Stroke	5				5	5		
Recurrence								
Hospitalized Ischemic Stroke	112	111	102	117	95	98	107	102
Hospitalized Hemorrhagic Stroke	14	17	12	14	20	16	13	10
Total Hospitalized Ischemic Stroke	911	874	806	884	784	813	843	814
Total Hospitalized Hemorrhagic Stroke	200	181	186	187	168	204	172	170
Total Number of Stroke Hospitalizations	1,111	1,055	992	1,071	952	1,017	1,015	984
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	27.29	29.61	25.17	25.16	25.73	25.28	24.66	24.80
Hospitalized Hemorrhagic Stroke	22.22	20.84	23.20	24.83	18.39	26.84	18.14	15.98
Readmission								
Hospitalized Ischemic Stroke	30.75	62.13	55.06	37.82	59.43	44.47	33.67	11.30
Hospitalized Hemorrhagic Stroke	26.60	3.67	16.33	11.00	6.20	24.20	13.50	9.33
Recurrence								
Hospitalized Ischemic Stroke	30.24	29.89	22.99	25.25	21.05	21.63	22.32	22.10
Hospitalized Hemorrhagic Stroke	21.29	5.65	38.08	12.86	22.50	22.25	38.92	18.00
Total Hospitalized Ischemic Stroke	27.70	30.24	25.56	25.41	25.46	25.19	24.49	24.13
Total Hospitalized Hemorrhagic Stroke	22.27	19.13	24.05	23.86	18.52	26.42	19.60	15.98
Total Number of Stroke Hospitalizations	26.72	28.34	25.28	25.14	24.24	25.44	23.66	22.72
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	21,481	22,121	17,264	18,867	17,547	17,693	17,851	17,159
Hospitalized Hemorrhagic Stroke	4,022	3,356	3,967	4,270	2,630	4,912	2,811	2,509
Readmission								
Hospitalized Ischemic Stroke	369	994	991	643	416	667	404	226
Hospitalized Hemorrhagic Stroke	133	11	49	11	31	121	54	28
Recurrence								
Hospitalized Ischemic Stroke	3,387	3,318	2,345	2,954	2,000	2,120	2,388	2,254
Hospitalized Hemorrhagic Stroke	298	96	457	180	450	356	506	180
Total Days - Hospitalized Ischemic Stroke	25,237	26,433	20,600	22,464	19,963	20,480	20,643	19,639
Total Days - Hospitalized Hemorrhagic Stroke	4,453	3,463	4,473	4,461	3,111	5,389	3,371	2,717
Total Days	29,690	29,896	25,073	26,925	23,074	25,869	24,014	22,356
* Age 20 and older								
<i>Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.</i>								

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long-term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

Data Source: Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care facility').

Discharge Disposition for Hospitalized Ischemic Stroke



Discharge Disposition Following a Hospitalization for Stroke
Patient Died or Was Discharged to a Continuing Care Facility
 Adults* Residing in Vancouver Island Health Authority
 2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	787	747	686	750	682	700	724	692
Hospitalized Hemorrhagic Stroke	181	161	171	172	143	183	155	157
Readmission								
Hospitalized Ischemic Stroke	12	16	18	17	7	15	12	20
Hospitalized Hemorrhagic Stroke	5				5	5		
Recurrence								
Hospitalized Ischemic Stroke	112	111	102	117	95	98	107	102
Hospitalized Hemorrhagic Stroke	14	17	12	14	20	16	13	10
Total Hospitalized Ischemic Stroke	911	874	806	884	784	813	843	814
Total Hospitalized Hemorrhagic Stroke	200	181	186	187	168	204	172	170
Total Number of Stroke Hospitalizations	1,111	1,055	992	1,071	952	1,017	1,015	984
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	214	197	164	202	167	172	221	185
Discharged to a Continuing Care Facility	103	97	95	90	111	103	84	69
Hospitalized Hemorrhagic Stroke								
Died	88	78	98	93	65	91	65	64
Discharged to a Continuing Care Facility	9	14	13	10	7	20	9	12
Readmission								
Hospitalized Ischemic Stroke								
Died				5				
Discharged to a Continuing Care Facility								
Hospitalized Hemorrhagic Stroke								
Died								
Discharged to a Continuing Care Facility								
Recurrence								
Hospitalized Ischemic Stroke								
Died	26	31	26	28	31	29	22	21
Discharged to a Continuing Care Facility	14	21	13	20	18	13	24	19
Hospitalized Hemorrhagic Stroke								
Died	7	8		8	11	9	6	
Discharged to a Continuing Care Facility								
Total Hospitalized Ischemic Stroke	244	230	193	235	200	203	245	210
Discharged to a Continuing Care Facility	118	122	110	114	130	116	110	89
Death and Disability	362	352	303	349	330	319	355	299
Total Hospitalized Hemorrhagic Stroke	96	86	101	102	79	101	71	68
Discharged to a Continuing Care Facility	10	15	17	13	8	24	11	12
Death and Disability	106	101	118	115	87	125	82	80
Total Number of Stroke Hospitalizations	340	316	294	337	279	304	316	278
Discharged to a Continuing Care Facility	128	137	127	127	138	140	121	101
Death and Disability	468	453	421	464	417	444	437	379
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	27.2%	26.4%	23.9%	26.9%	24.5%	24.6%	30.5%	26.7%
Discharged to a Continuing Care Facility	13.1%	13.0%	13.8%	12.0%	16.3%	14.7%	11.6%	10.0%
Hospitalized Hemorrhagic Stroke								
Died	48.6%	48.4%	57.3%	54.1%	45.5%	49.7%	41.9%	40.8%
Discharged to a Continuing Care Facility	5.0%	8.7%	7.6%	5.8%	4.9%	10.9%	5.8%	7.6%
Readmission								
Hospitalized Ischemic Stroke								
Died	33.3%	12.5%	16.7%	29.4%	28.6%	13.3%	16.7%	20.0%
Discharged to a Continuing Care Facility	8.3%	25.0%	11.1%	23.5%	14.3%	0.0%	16.7%	5.0%
Hospitalized Hemorrhagic Stroke								
Died	20.0%	0.0%	0.0%	100.0%	60.0%	20.0%	0.0%	0.0%
Discharged to a Continuing Care Facility	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	0.0%	0.0%
Recurrence								
Hospitalized Ischemic Stroke								
Died	23.2%	27.9%	25.5%	23.9%	32.6%	29.6%	20.6%	20.6%
Discharged to a Continuing Care Facility	12.5%	18.9%	12.7%	17.1%	18.9%	13.3%	22.4%	18.6%
Hospitalized Hemorrhagic Stroke								
Died	50.0%	47.1%	25.0%	57.1%	55.0%	56.3%	46.2%	40.0%
Discharged to a Continuing Care Facility	7.1%	5.9%	33.3%	21.4%	5.0%	18.8%	15.4%	0.0%
Total Hospitalized Ischemic Stroke	26.8%	26.3%	23.9%	26.6%	25.5%	25.0%	29.1%	25.8%
Discharged to a Continuing Care Facility	13.0%	14.0%	13.6%	12.9%	16.6%	14.3%	13.0%	10.9%
Death and Disability	39.7%	40.3%	37.6%	39.5%	42.1%	39.2%	42.1%	36.7%
Total Hospitalized Hemorrhagic Stroke	48.0%	47.5%	54.3%	54.5%	47.0%	49.5%	41.3%	40.0%
Discharged to a Continuing Care Facility	5.0%	8.3%	9.1%	7.0%	4.8%	11.8%	6.4%	7.1%
Death and Disability	53.0%	55.8%	63.4%	61.5%	51.8%	61.3%	47.7%	47.1%
Total Number of Stroke Hospitalizations	30.6%	30.0%	29.6%	31.5%	29.3%	29.9%	31.1%	28.3%
Discharged to a Continuing Care Facility	11.5%	13.0%	12.8%	11.9%	14.5%	13.8%	11.9%	10.3%
Death and Disability	42.1%	42.9%	42.4%	43.3%	43.8%	43.7%	43.1%	38.5%

* Age 20 and older

Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.

**Indicator #5 –
Death and
Dependency
(continued)**

Vancouver Island
Health Authority –

Discharge Disposition
Data Trends

SOUTH VANCOUVER ISLAND HSDA

Indicators and Metrics

SOUTH VANCOUVER ISLAND HSDA INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome Adults* Residing in the South Vancouver Island HSDA 2001/02 to 2008/09

	Fiscal Year								% Change 01/02 to 08/09
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	379	377	345	366	277	331	356	335	-11.6%
Hospitalized Hemorrhagic Stroke	82	82	96	85	65	95	65	72	-12.2%
Sub-total	461	459	441	451	342	426	421	407	-11.7%
Hospitalized TIA	127	115	110	144	113	100	90	73	-42.5%
Non-hospitalized TIA/Stroke	379	427	479	508	527	540	565	605	59.6%
Sub-total	506	542	589	652	640	640	655	678	34.0%
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	1,955	2,044	2,073	2,118	2,076	2,100	2,153	2,157	10.3%
Hospitalized Hemorrhagic Stroke	347	362	394	397	385	417	409	432	24.5%
Sub-total	2,302	2,406	2,467	2,515	2,461	2,517	2,562	2,589	12.5%
Hospitalized TIA	730	777	819	889	899	922	901	902	23.6%
Non-hospitalized TIA/Stroke	2,490	2,679	2,891	3,121	3,357	3,573	3,856	4,107	64.9%
Sub-total	3,220	3,456	3,710	4,010	4,256	4,495	4,757	5,009	55.6%
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	0.847	0.832	0.728	0.769	0.567	0.641	0.680	0.642	-24.2%
Hospitalized Hemorrhagic Stroke	0.217	0.199	0.200	0.199	0.141	0.211	0.144	0.156	-28.1%
Sub-total	1.069	1.037	0.936	0.974	0.713	0.858	0.829	0.802	-25.0%
Hospitalized TIA	0.297	0.251	0.234	0.307	0.232	0.201	0.170	0.142	-52.1%
Non-hospitalized TIA/Stroke	0.938	0.997	1.099	1.140	1.165	1.162	1.198	1.249	33.2%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	4.186	4.276	4.245	4.249	4.065	3.985	3.989	3.930	-6.1%
Hospitalized Hemorrhagic Stroke	0.878	0.902	0.926	0.932	0.888	0.942	0.918	0.954	8.7%
Sub-total	5.064	5.178	5.172	5.181	4.954	4.927	4.906	4.884	-3.6%
Hospitalized TIA	1.600	1.652	1.697	1.806	1.786	1.774	1.682	1.633	2.1%
Non-hospitalized TIA/Stroke	5.796	6.095	6.425	6.761	7.103	7.381	7.708	8.019	38.4%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	4.51%	1.73%	2.26%	2.06%	2.61%	2.42%	2.02%		
365-Day Conversion Rate	7.38%	3.26%	4.53%	3.32%	3.92%	4.03%	2.95%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						16	23	13	
Total Number						331	356	335	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						4.83%	6.46%	3.88%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	379	377	345	366	277	331	356	335	-11.6%
ALOS	26.52	31.92	25.56	27.54	26.40	25.20	26.01	23.86	-10.0%
Patient Days	10,052	12,035	8,817	10,078	7,313	8,340	9,259	7,993	-20.5%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	82	82	96	85	65	95	65	72	-12.2%
ALOS	24.98	20.88	25.08	24.58	11.82	26.22	21.31	15.13	-39.4%
Patient Days	2,048	1,712	2,408	2,089	768	2,491	1,385	1,089	-46.8%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	31.4%	27.9%	26.7%	26.2%	28.2%	26.3%	35.1%	29.0%	-7.8%
Discharged to Home	45.6%	46.2%	49.6%	47.0%	43.7%	44.4%	40.7%	49.3%	7.9%
Home with Support Services	10.0%	9.8%	10.4%	12.8%	9.4%	11.5%	8.1%	10.1%	1.2%
Continuing Care Facility	11.1%	14.1%	13.0%	13.1%	17.0%	16.6%	14.9%	10.7%	-3.0%
Other	1.8%	2.1%	<u>0.3%</u>	<u>0.8%</u>	1.8%	<u>1.2%</u>	<u>1.1%</u>	<u>0.9%</u>	-51.5%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	48.8%	53.7%	64.6%	57.6%	60.0%	53.7%	43.1%	40.3%	-17.4%
Discharged to Home	39.0%	35.4%	20.8%	27.1%	26.2%	26.3%	46.2%	41.7%	6.8%
Home with Support Services	<u>2.4%</u>	<u>3.7%</u>	<u>4.2%</u>	8.2%	9.2%	5.3%	<u>1.5%</u>	<u>4.2%</u>	70.8%
Continuing Care Facility	6.1%	6.1%	10.4%	7.1%	<u>4.6%</u>	12.6%	7.7%	9.7%	59.4%
Other	<u>3.7%</u>	<u>1.2%</u>				<u>2.1%</u>	<u>1.5%</u>	<u>4.2%</u>	13.9%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	24.0%	21.8%	18.8%	19.9%	22.4%	22.1%	27.0%	24.5%	1.9%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	20.8%	21.0%	24.3%	23.2%	25.1%	21.3%	25.4%	19.4%	-7.0%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	46.3%	50.0%	59.4%	57.6%	58.5%	50.5%	41.5%	40.3%	-13.1%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	13.6%	22.0%	25.6%	16.7%	22.2%	17.0%	7.9%	4.7%	-65.9%

Grey Shading = Not Applicable/Available

Underlined % are based on a numerator of less than 5

* Age 20 and older

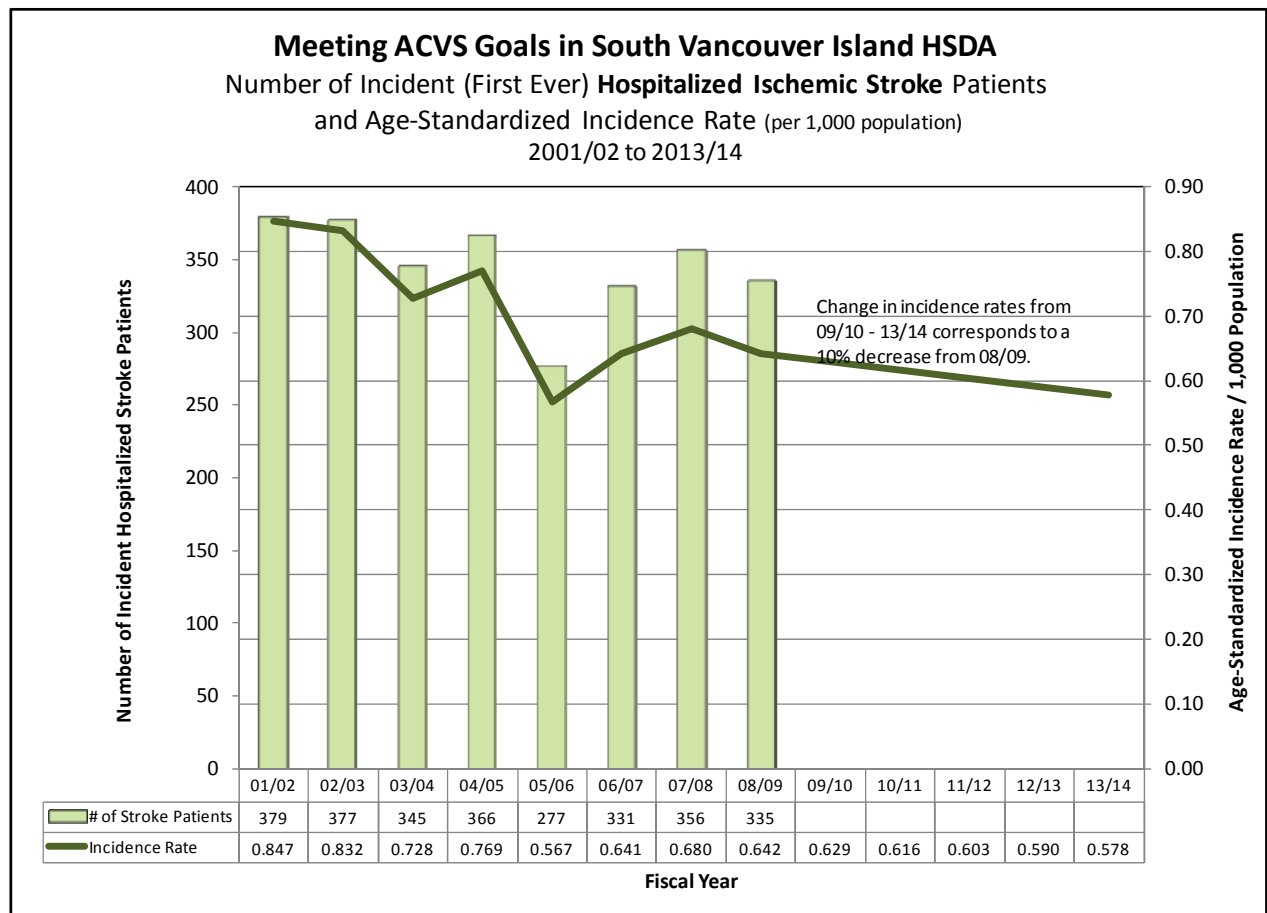
SOUTH VANCOUVER ISLAND HSDA INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **South Vancouver Island HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

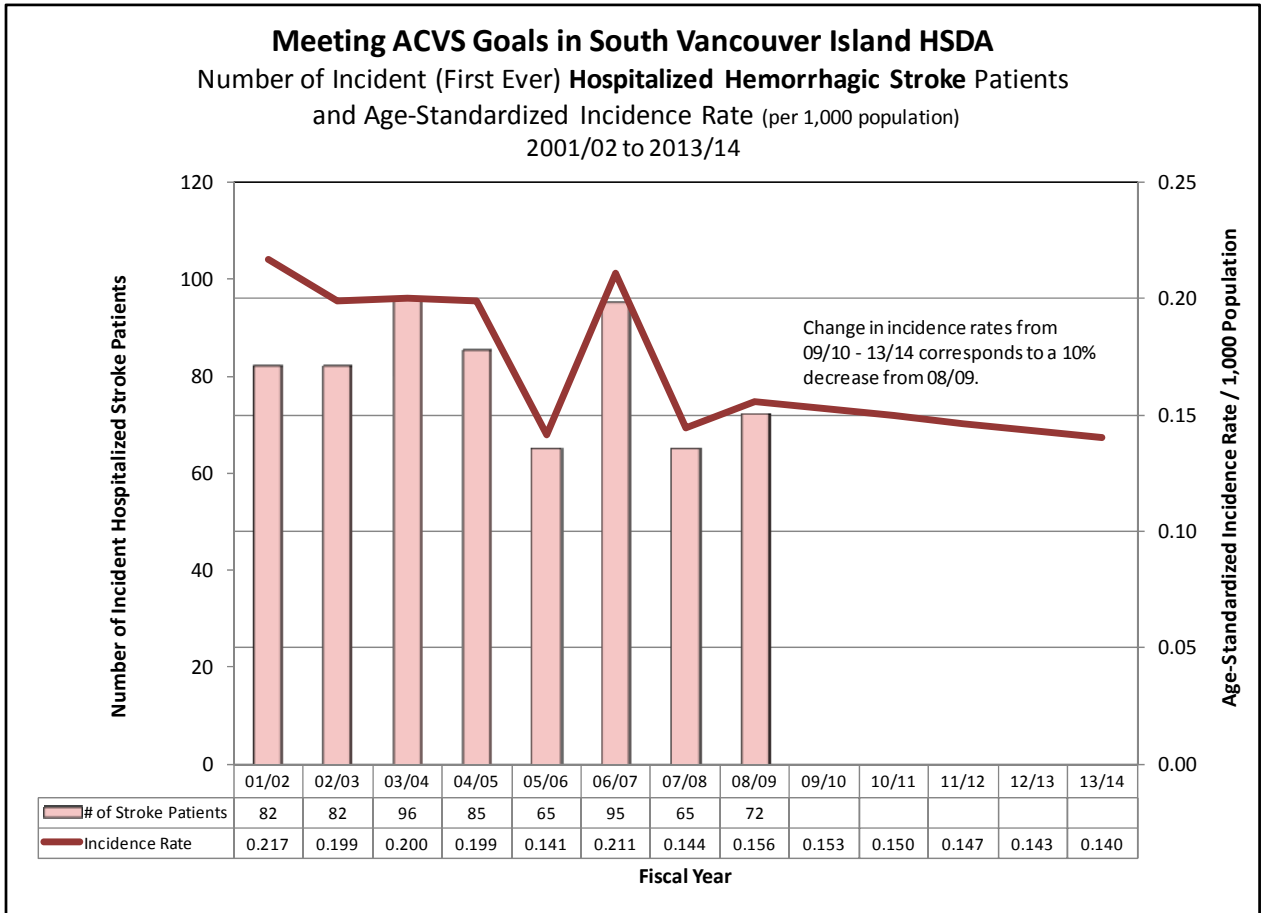
Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source: updated ACVS Registry*).

South Vancouver Island HSDA – Incident Hospitalized Ischemic Stroke Patients



Indicator #3 - Incidence Rate (continued)

South Vancouver Island HSDA – Incident Hospitalized Hemorrhagic Stroke Patients

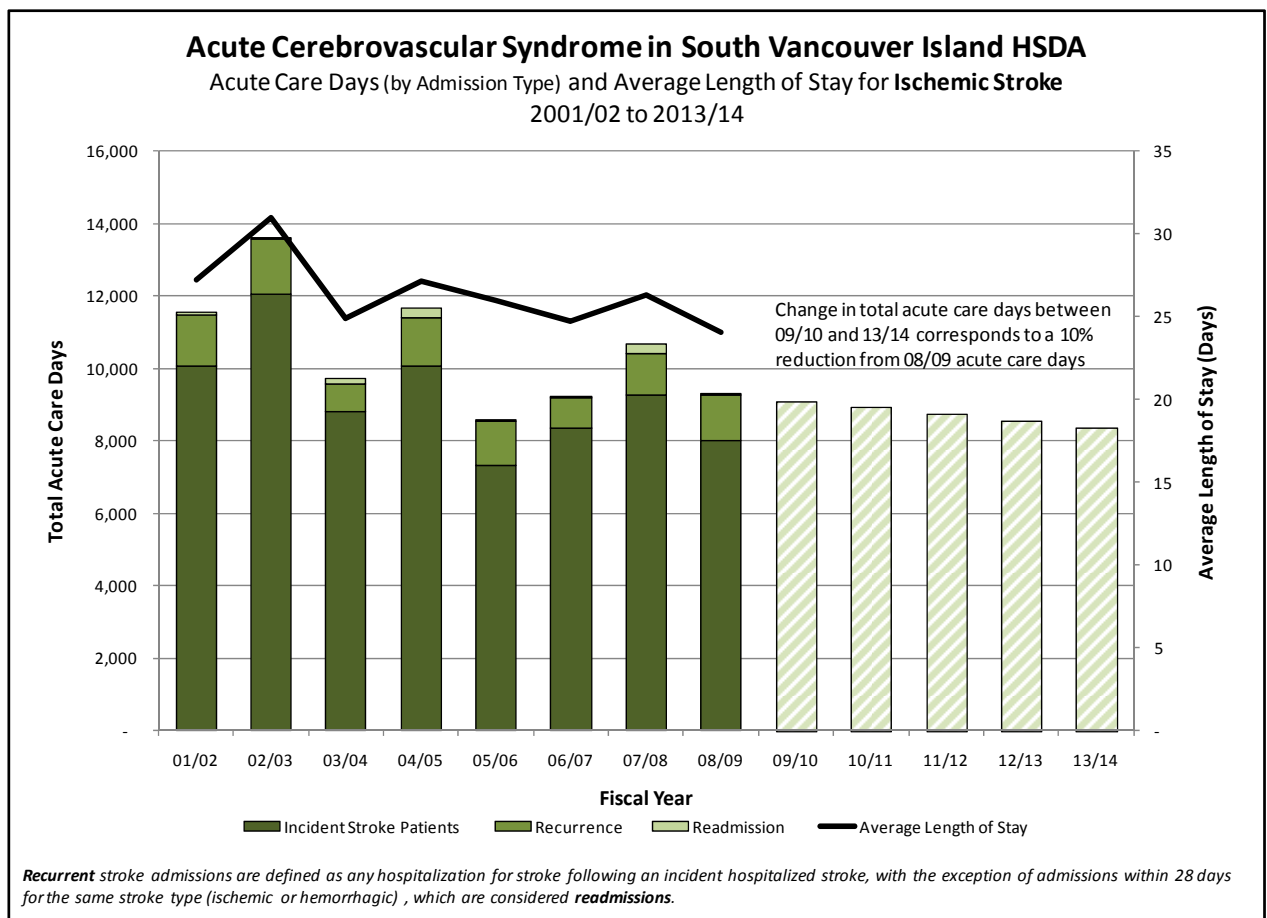


Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

Data Source: Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

South Vancouver Island HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



Indicator #4 – Acute Care Days (continued)

South Vancouver Island HSDA – Hospitalization and ALOS Data Trends

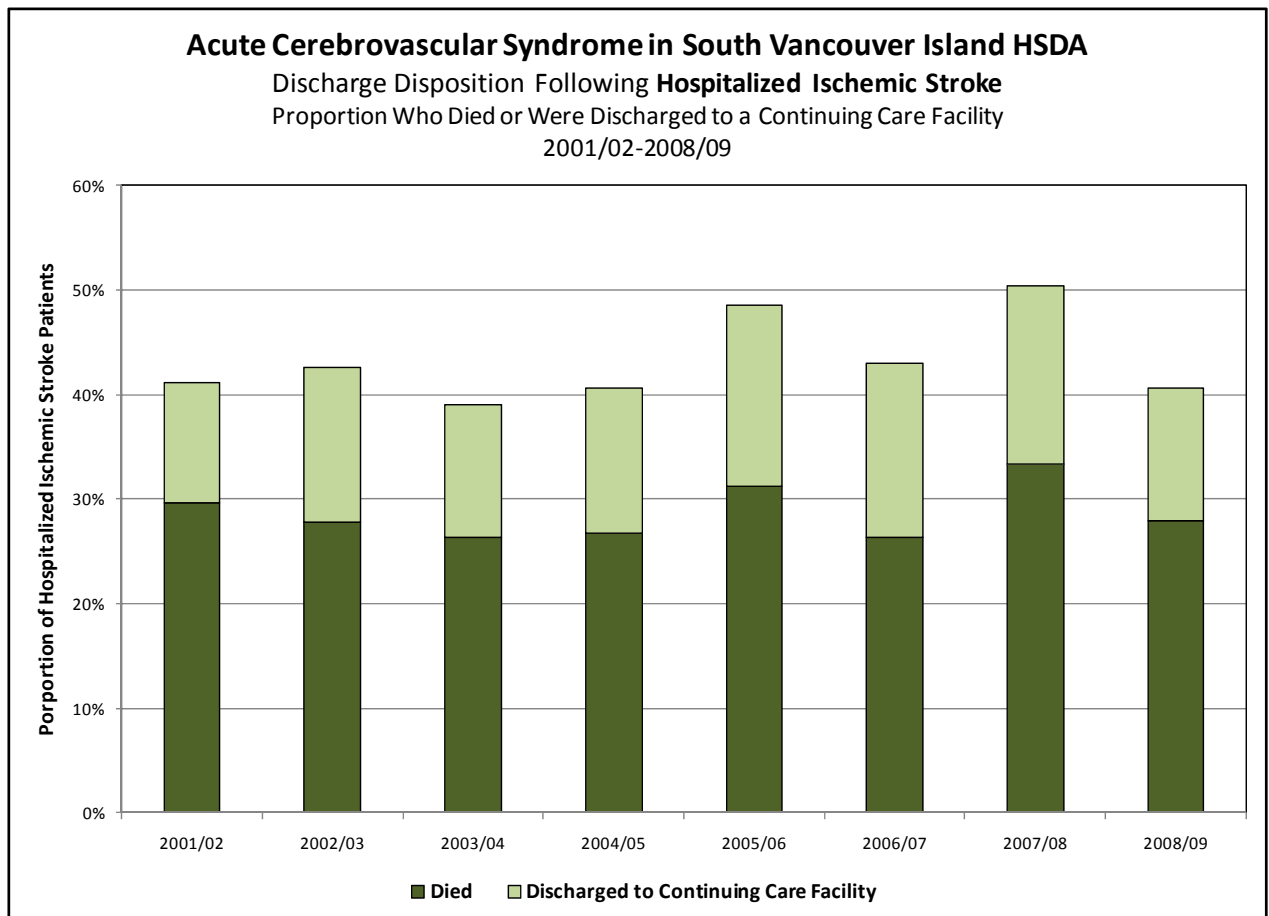
Hospitalization and ALOS for Stroke								
Adults* Residing in South Vancouver Island HSDA								
2001/02 to 2008/09								
	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	379	377	345	366	277	331	356	335
Hospitalized Hemorrhagic Stroke	82	82	96	85	65	95	65	72
Readmission								
Hospitalized Ischemic Stroke			7	9			5	6
Hospitalized Hemorrhagic Stroke								-
Recurrence								
Hospitalized Ischemic Stroke	44	60	38	54	52	37	44	45
Hospitalized Hemorrhagic Stroke	9	7	10	5	12	9	6	
Total Hospitalized Ischemic Stroke	425	439	390	429	330	372	405	386
Total Hospitalized Hemorrhagic Stroke	92	91	107	91	78	107	73	76
Total Number of Stroke Hospitalizations	517	530	497	520	408	479	478	462
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	26.52	31.92	25.56	27.54	26.40	25.20	26.01	23.86
Hospitalized Hemorrhagic Stroke	24.98	20.88	25.08	24.58	11.82	26.22	21.31	15.13
Readmission								
Hospitalized Ischemic Stroke	46.00	14.00	19.57	28.11	37.00	3.75	53.60	8.17
Hospitalized Hemorrhagic Stroke	11.00	3.00	37.00	11.00	1.00	17.67	13.50	
Recurrence								
Hospitalized Ischemic Stroke	32.07	25.62	19.92	24.35	23.33	22.95	25.95	27.89
Hospitalized Hemorrhagic Stroke	23.56	7.14	44.50	5.00	15.33	20.44	27.00	14.75
Total Hospitalized Ischemic Stroke	27.19	30.98	24.90	27.15	25.95	24.74	26.34	24.09
Total Hospitalized Hemorrhagic Stroke	24.68	19.43	27.01	23.35	12.22	25.50	21.56	15.11
Total Number of Stroke Hospitalizations	26.74	29.00	25.35	26.48	23.32	24.91	25.61	22.61
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	10,052	12,035	8,817	10,078	7,313	8,340	9,259	7,993
Hospitalized Hemorrhagic Stroke	2,048	1,712	2,408	2,089	768	2,491	1,385	1,089
Readmission								
Hospitalized Ischemic Stroke	92	28	137	253	37	15	268	49
Hospitalized Hemorrhagic Stroke	11	6	37	11		53	27	-
Recurrence								
Hospitalized Ischemic Stroke	1,411	1,537	757	1,315	1,213	849	1,142	1,255
Hospitalized Hemorrhagic Stroke	212	50	445	25	184	184	162	59
Total Days - Hospitalized Ischemic Stroke	11,555	13,600	9,711	11,646	8,563	9,204	10,669	9,297
Total Days - Hospitalized Hemorrhagic Stroke	2,271	1,768	2,890	2,125	953	2,728	1,574	1,148
Total Days	13,826	15,368	12,601	13,771	9,516	11,932	12,243	10,445
* Age 20 and older								
<i>Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.</i>								

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long-term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

Data Source: Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. Discharge Abstract Database (DAD) for discharge disposition ('died', 'discharged to a Continuing Care Facility').

South Vancouver Island HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Discharge Disposition Following a Hospitalization for Stroke

Patient Died or Was Discharged to a Continuing Care Facility

Adults* Residing in South Vancouver Island HSDA

2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	379	377	345	366	277	331	356	335
Hospitalized Hemorrhagic Stroke	82	82	96	85	65	95	65	72
Readmission								
Hospitalized Ischemic Stroke			7	9			5	6
Hospitalized Hemorrhagic Stroke								
Recurrence								
Hospitalized Ischemic Stroke	44	60	38	54	52	37	44	45
Hospitalized Hemorrhagic Stroke	9	7	10	5	12	9	6	
Total Hospitalized Ischemic Stroke	425	439	390	429	330	372	405	386
Total Hospitalized Hemorrhagic Stroke	92	91	107	91	78	107	73	76
Total Number of Stroke Hospitalizations	517	530	497	520	408	479	478	462
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	119	105	92	96	78	87	125	97
Discharged to a Continuing Care Facility	42	53	45	48	47	55	53	36
Hospitalized Hemorrhagic Stroke								
Died	40	44	62	49	39	51	28	29
Discharged to a Continuing Care Facility	5	5	10	6	3	12	5	7
Readmission								
Hospitalized Ischemic Stroke								
Died								
Discharged to a Continuing Care Facility								
Hospitalized Hemorrhagic Stroke								
Died								
Discharged to a Continuing Care Facility								
Recurrence								
Hospitalized Ischemic Stroke								
Died	7	17	11	15	24	10	10	10
Discharged to a Continuing Care Facility	7	11	3	10	10	7	15	13
Hospitalized Hemorrhagic Stroke								
Died	6				8	5		
Discharged to a Continuing Care Facility								
Total Hospitalized Ischemic Stroke	126	122	103	115	103	98	135	108
Discharged to a Continuing Care Facility	49	65	49	59	57	62	69	49
Death and Disability	175	187	152	174	160	160	204	157
Total Hospitalized Hemorrhagic Stroke	47	48	65	54	48	56	30	32
Discharged to a Continuing Care Facility	6	5	13	7	15	6	7	7
Death and Disability	53	53	78	61	52	71	36	39
Total Number of Stroke Hospitalizations	173	170	168	169	151	154	165	140
Died	173	170	168	169	151	154	165	140
Discharged to a Continuing Care Facility	55	70	62	66	61	77	75	56
Death and Disability	228	240	230	235	212	231	240	196
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	31.4%	27.9%	26.7%	26.2%	28.2%	26.3%	35.1%	29.0%
Discharged to a Continuing Care Facility	11.1%	14.1%	13.0%	13.1%	17.0%	16.6%	14.9%	10.7%
Hospitalized Hemorrhagic Stroke								
Died	48.8%	53.7%	64.6%	57.6%	60.0%	53.7%	43.1%	40.3%
Discharged to a Continuing Care Facility	6.1%	6.1%	10.4%	7.1%	4.6%	12.6%	7.7%	9.7%
Readmission								
Hospitalized Ischemic Stroke								
Died	0.0%	0.0%	0.0%	44.4%	100.0%	25.0%	0.0%	16.7%
Discharged to a Continuing Care Facility	0.0%	50.0%	14.3%	11.1%	0.0%	0.0%	20.0%	0.0%
Hospitalized Hemorrhagic Stroke								
Died	100.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	
Discharged to a Continuing Care Facility	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Recurrence								
Hospitalized Ischemic Stroke								
Died	15.9%	28.3%	28.9%	27.8%	46.2%	27.0%	22.7%	22.2%
Discharged to a Continuing Care Facility	15.9%	18.3%	7.9%	18.5%	19.2%	18.9%	34.1%	28.9%
Hospitalized Hemorrhagic Stroke								
Died	66.7%	57.1%	30.0%	80.0%	66.7%	55.6%	33.3%	75.0%
Discharged to a Continuing Care Facility	11.1%	0.0%	30.0%	20.0%	8.3%	33.3%	16.7%	0.0%
Total Hospitalized Ischemic Stroke	29.6%	27.8%	26.4%	26.8%	31.2%	26.3%	33.3%	28.0%
Discharged to a Continuing Care Facility	11.5%	14.8%	12.6%	13.8%	17.3%	16.7%	17.0%	12.7%
Death and Disability	41.2%	42.6%	39.0%	40.6%	48.5%	43.0%	50.4%	40.7%
Total Hospitalized Hemorrhagic Stroke	51.1%	52.7%	60.7%	59.3%	61.5%	52.3%	41.1%	42.1%
Discharged to a Continuing Care Facility	6.5%	5.5%	12.1%	7.7%	5.1%	14.0%	8.2%	9.2%
Death and Disability	57.6%	58.2%	72.9%	67.0%	66.7%	66.4%	49.3%	51.3%
Total Number of Stroke Hospitalizations	33.5%	32.1%	33.8%	32.5%	37.0%	32.2%	34.5%	30.3%
Discharged to a Continuing Care Facility	10.6%	13.2%	12.5%	12.7%	15.0%	16.1%	15.7%	12.1%
Death and Disability	44.1%	45.3%	46.3%	45.2%	52.0%	48.2%	50.2%	42.4%

* Age 20 and older

Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.

Indicator #5 – Death and Dependency (continued)

South Vancouver Island HSDA – Discharge Disposition Data Trends

CENTRAL VANCOUVER ISLAND HSDA

Indicators and Metrics

CENTRAL VANCOUVER ISLAND HSDA INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome									
Adults* Residing in the Central Vancouver Island HSDA									
2001/02 to 2008/09									
	Fiscal Year								% Change 01/02 to 08/09
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	298	247	238	274	278	243	249	250	-16.1%
Hospitalized Hemorrhagic Stroke	69	54	60	69	53	69	62	54	-21.7%
Sub-total	367	301	298	343	331	312	311	304	-17.2%
Hospitalized TIA	106	102	95	104	94	71	103	81	-23.6%
Non-hospitalized TIA/Stroke	309	333	337	341	408	437	464	488	57.9%
Sub-total	415	435	432	445	502	508	567	569	37.1%
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	1,410	1,446	1,472	1,548	1,609	1,642	1,685	1,730	22.7%
Hospitalized Hemorrhagic Stroke	287	297	324	349	354	387	395	409	42.5%
Sub-total	1,697	1,743	1,796	1,897	1,963	2,029	2,080	2,139	26.0%
Hospitalized TIA	618	654	688	721	738	750	791	807	30.6%
Non-hospitalized TIA/Stroke	1,746	1,889	2,041	2,197	2,392	2,621	2,849	3,050	74.7%
Sub-total	2,364	2,543	2,729	2,918	3,130	3,371	3,640	3,857	63.2%
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	1.041	0.828	0.782	0.861	0.831	0.702	0.691	0.676	-35.1%
Hospitalized Hemorrhagic Stroke	0.251	0.187	0.201	0.222	0.176	0.216	0.182	0.158	-37.2%
Sub-total	1.300	1.021	0.989	1.089	1.012	0.925	0.879	0.839	-35.5%
Hospitalized TIA	0.362	0.338	0.302	0.322	0.272	0.203	0.282	0.217	-39.9%
Non-hospitalized TIA/Stroke	1.095	1.155	1.118	1.097	1.252	1.315	1.354	1.373	25.4%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	4.621	4.579	4.520	4.581	4.572	4.497	4.442	4.390	-5.0%
Hospitalized Hemorrhagic Stroke	1.020	1.035	1.095	1.144	1.134	1.210	1.200	1.203	18.0%
Sub-total	5.641	5.614	5.615	5.725	5.706	5.706	5.642	5.593	-0.9%
Hospitalized TIA	2.027	2.075	2.108	2.128	2.086	2.040	2.071	2.031	0.2%
Non-hospitalized TIA/Stroke	6.068	6.371	6.635	6.873	7.183	7.580	7.943	8.205	35.2%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate	5.99%	3.32%	4.55%	2.55%	2.64%	1.61%	1.99%		
365-Day Conversion Rate	7.73%	5.45%	5.50%	3.94%	4.67%	3.02%	3.98%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						4	12	12	
Total Number						243	249	250	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						<u>1.65%</u>	4.82%	4.80%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	298	247	238	274	278	243	249	250	-16.1%
ALOS	25.45	21.53	23.90	22.45	21.95	23.33	22.55	24.85	-2.4%
Patient Days	7,585	5,318	5,689	6,152	6,101	5,670	5,614	6,213	-18.1%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	69	54	60	69	53	69	62	54	-21.7%
ALOS	16.20	24.72	19.05	21.70	25.32	32.91	16.27	19.56	20.7%
Patient Days	1,118	1,335	1,143	1,497	1,342	2,271	1,009	1,056	-5.5%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	23.8%	25.9%	20.6%	28.1%	21.2%	22.6%	26.5%	25.2%	5.8%
Discharged to Home	41.3%	42.9%	48.7%	50.7%	51.8%	46.1%	48.2%	44.4%	7.6%
Home with Support Services	17.4%	17.0%	12.6%	8.0%	8.6%	14.0%	12.4%	18.8%	7.7%
Continuing Care Facility	16.4%	13.0%	16.8%	12.0%	17.6%	15.6%	10.4%	9.2%	-44.0%
Other	<u>1.0%</u>	<u>1.2%</u>	<u>1.3%</u>	<u>1.1%</u>	<u>0.7%</u>	<u>1.6%</u>	2.4%	2.4%	138.4%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	52.2%	44.4%	53.3%	50.7%	30.2%	46.4%	45.2%	31.5%	-39.7%
Discharged to Home	31.9%	33.3%	36.7%	37.7%	45.3%	31.9%	46.8%	38.9%	22.0%
Home with Support Services	<u>4.3%</u>	<u>7.4%</u>	<u>3.3%</u>	<u>2.9%</u>	<u>7.5%</u>	<u>5.8%</u>	<u>3.2%</u>	14.8%	240.7%
Continuing Care Facility	<u>2.9%</u>	14.8%	<u>5.0%</u>	<u>5.8%</u>	<u>7.5%</u>	11.6%	<u>4.8%</u>	<u>7.4%</u>	155.6%
Other	8.7%		<u>1.7%</u>	<u>2.9%</u>	9.4%	<u>4.3%</u>		<u>7.4%</u>	-14.8%
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	19.1%	20.6%	18.5%	24.1%	16.9%	19.3%	23.3%	22.0%	15.0%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	23.2%	20.9%	15.5%	20.7%	19.9%	15.3%	20.4%	15.9%	-31.6%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	50.7%	40.7%	53.3%	47.8%	30.2%	42.0%	45.2%	31.5%	-37.9%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	8.8%	15.6%	10.7%	16.7%	10.8%	27.5%	5.9%	2.7%	-69.4%

Grey Shading = Not Applicable/Available

Underlined % are based on a numerator of less than 5

* Age 20 and older

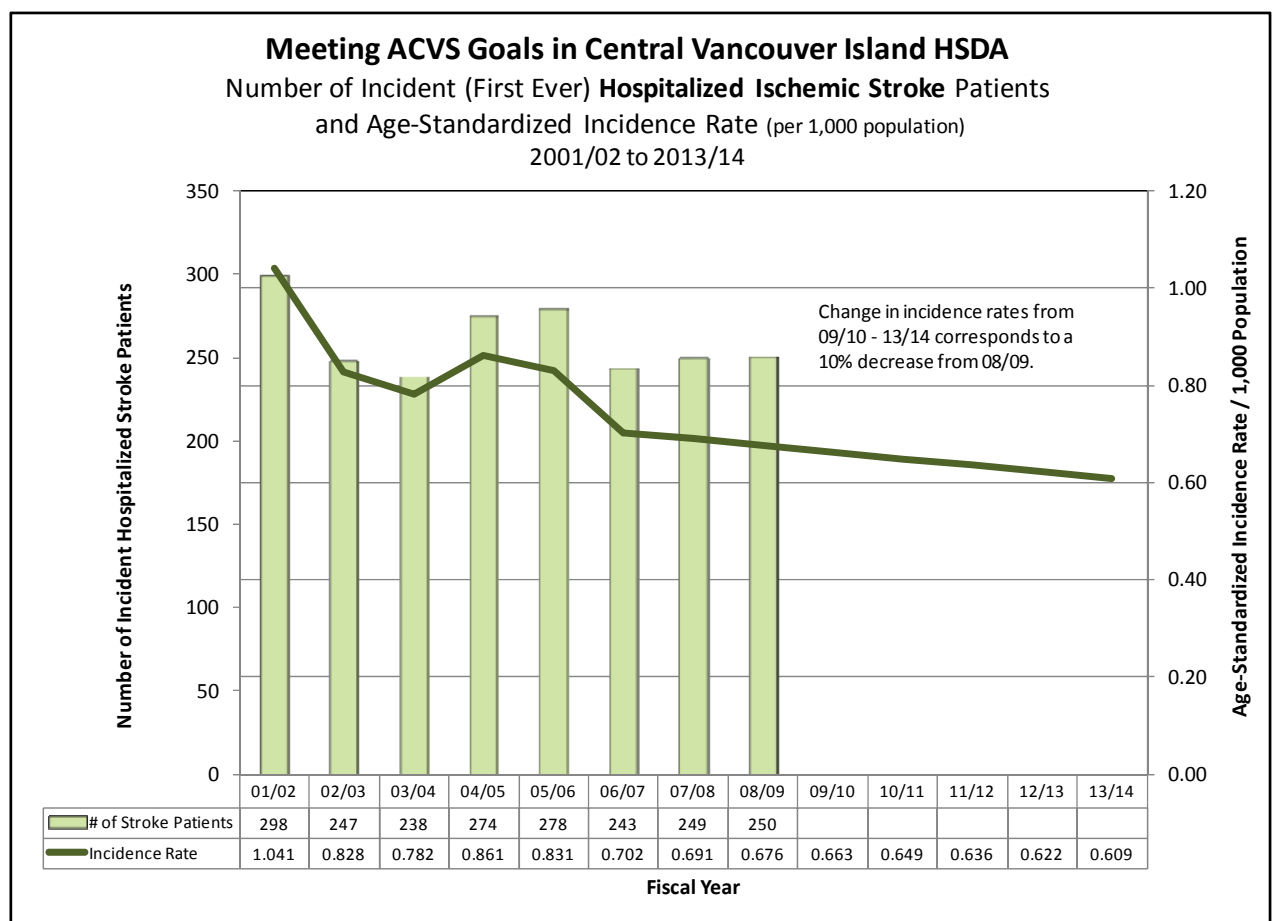
CENTRAL VANCOUVER ISLAND HSDA INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **Central Vancouver Island HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

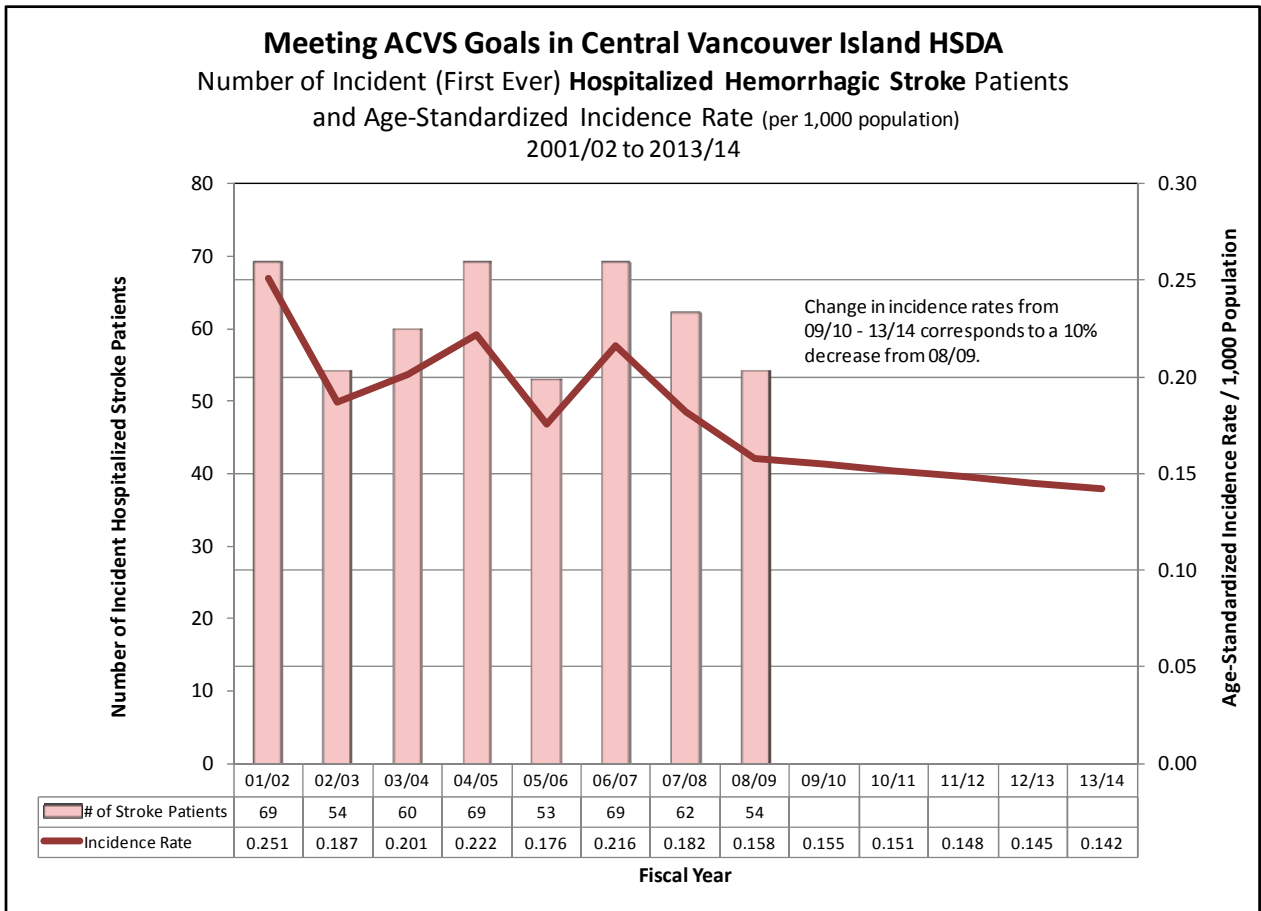
Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source*: updated ACVS Registry).

Central Vancouver Island HSDA – Incident Hospitalized Ischemic Stroke Patients



Indicator #3 – Incidence Rate (continued)

Central Vancouver Island HSDA – Incident Hospitalized Hemorrhagic Stroke Patients

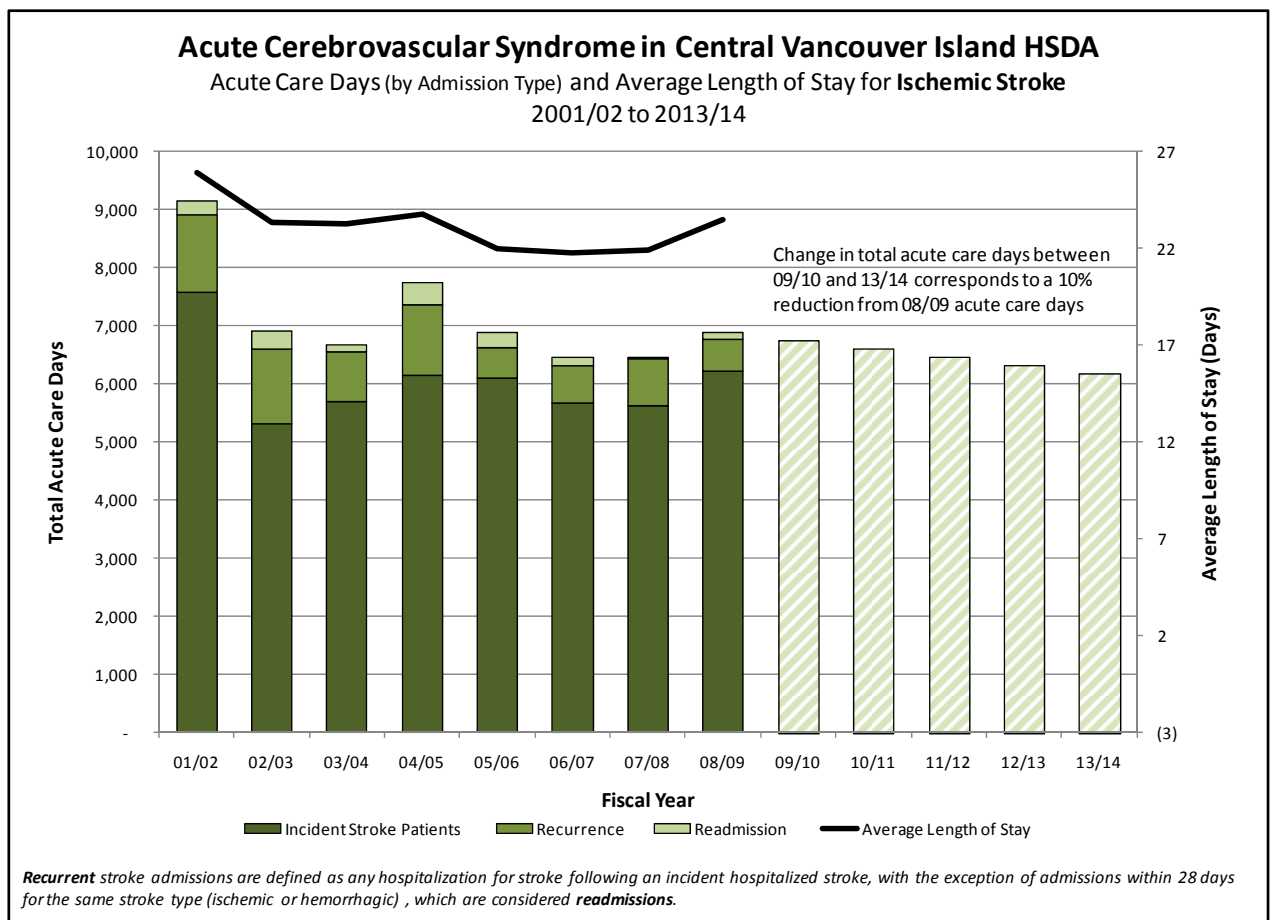


Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

Data Source: Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

Central Vancouver Island HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



Indicator #4 – Acute Care Days (continued)

Central Vancouver Island HSDA – Hospitalization and ALOS Data Trends

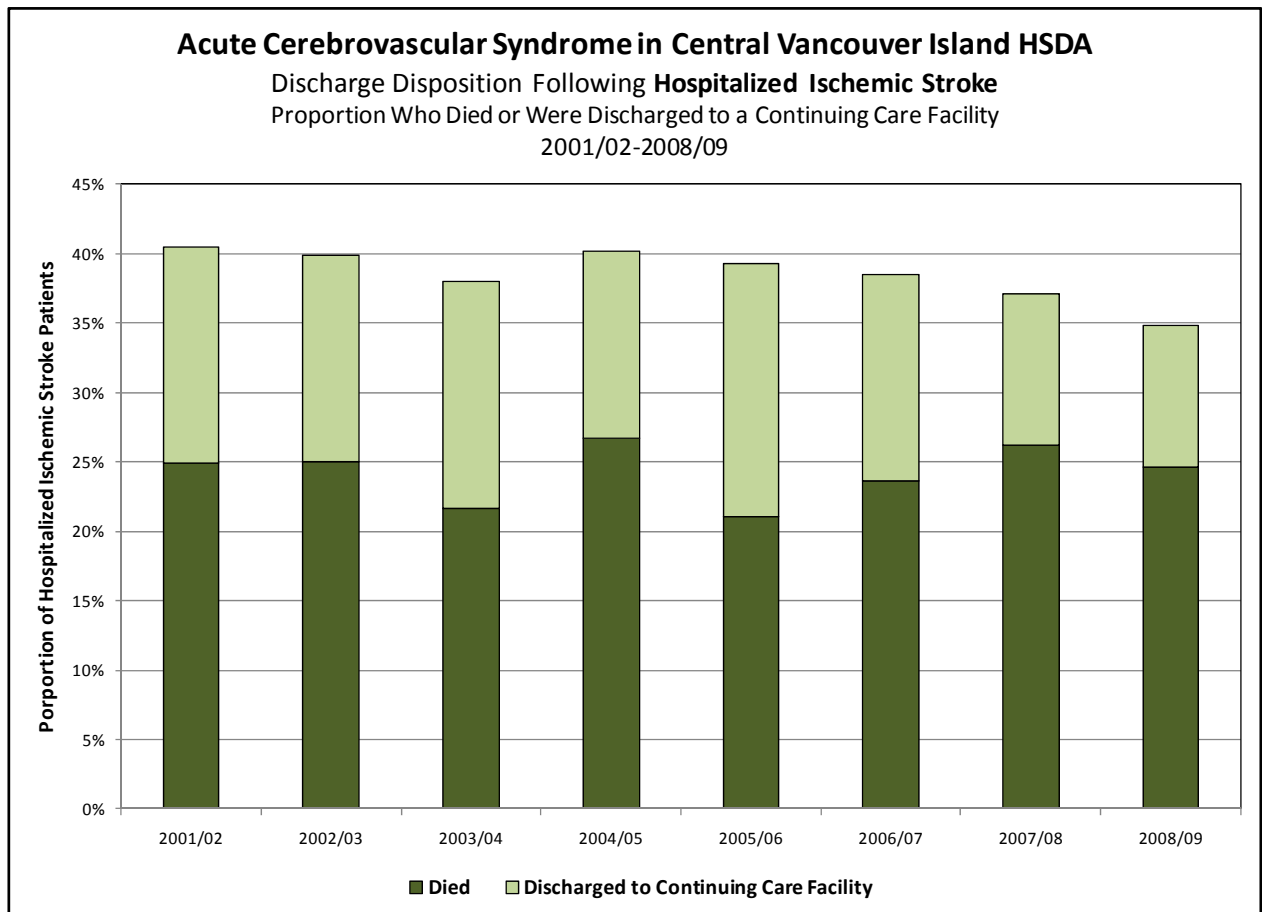
Hospitalization and ALOS for Stroke								
Adults* Residing in Central Vancouver Island HSDA								
2001/02 to 2008/09								
	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	298	247	238	274	278	243	249	250
Hospitalized Hemorrhagic Stroke	69	54	60	69	53	69	62	54
Readmission								
Hospitalized Ischemic Stroke	9	10	7	7		7		6
Hospitalized Hemorrhagic Stroke		-		-			-	
Recurrence								
Hospitalized Ischemic Stroke	46	39	42	45	32	46	42	37
Hospitalized Hemorrhagic Stroke	5	7		8	6	6	5	
Total Hospitalized Ischemic Stroke	353	296	287	326	313	296	294	293
Total Hospitalized Hemorrhagic Stroke	76	61	62	77	63	76	67	61
Total Number of Stroke Hospitalizations	429	357	349	403	376	372	361	354
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	25.45	21.53	23.90	22.45	21.95	23.33	22.55	24.85
Hospitalized Hemorrhagic Stroke	16.20	24.72	19.05	21.70	25.32	32.91	16.27	19.56
Readmission								
Hospitalized Ischemic Stroke	27.89	30.90	18.43	55.29	89.33	20.71	4.33	20.17
Hospitalized Hemorrhagic Stroke	6.50		11.00		7.50	67.00		9.33
Recurrence								
Hospitalized Ischemic Stroke	28.63	32.56	20.57	26.96	16.13	13.83	19.48	14.78
Hospitalized Hemorrhagic Stroke	17.20	4.14	11.00	19.25	11.67	25.33	35.20	26.00
Total Hospitalized Ischemic Stroke	25.93	23.30	23.28	23.78	22.00	21.79	21.92	23.48
Total Hospitalized Hemorrhagic Stroke	16.01	22.36	18.79	21.44	22.89	32.76	17.69	19.48
Total Number of Stroke Hospitalizations	24.17	23.14	22.48	23.33	22.15	24.03	21.14	22.79
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	7,585	5,318	5,689	6,152	6,101	5,670	5,614	6,213
Hospitalized Hemorrhagic Stroke	1,118	1,335	1,143	1,497	1,342	2,271	1,009	1,056
Readmission								
Hospitalized Ischemic Stroke	251	309	129	387	268	145	13	121
Hospitalized Hemorrhagic Stroke	13	-	11	-	30	67	-	28
Recurrence								
Hospitalized Ischemic Stroke	1,317	1,270	864	1,213	516	636	818	547
Hospitalized Hemorrhagic Stroke	86	29	11	154	70	152	176	104
Total Days - Hospitalized Ischemic Stroke	9,153	6,897	6,682	7,752	6,885	6,451	6,445	6,881
Total Days - Hospitalized Hemorrhagic Stroke	1,217	1,364	1,165	1,651	1,442	2,490	1,185	1,188
Total Days	10,370	8,261	7,847	9,403	8,327	8,941	7,630	8,069
* Age 20 and older								
<i>Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.</i>								

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long-term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

Data Source: Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. DAD for discharge disposition ('died', 'discharged to a Continuing Care facility').

Central Vancouver Island HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Discharge Disposition Following a Hospitalization for Stroke
Patient Died or Was Discharged to a Continuing Care Facility
 Adults* Residing in Central Vancouver Island HSDA
 2001/02 to 2008/09

Indicator #5 – Death and Dependency (continued)

Central Vancouver Island HSDA – Discharge Disposition Data Trends

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	298	247	238	274	278	243	249	250
Hospitalized Hemorrhagic Stroke	69	54	60	69	53	69	62	54
Readmission								
Hospitalized Ischemic Stroke	9	10	7	7	7	7	7	6
Hospitalized Hemorrhagic Stroke								
Recurrence								
Hospitalized Ischemic Stroke	46	39	42	45	32	46	42	37
Hospitalized Hemorrhagic Stroke	5	7		8	6	6	5	
Total Hospitalized Ischemic Stroke	353	296	287	326	313	296	294	293
Total Hospitalized Hemorrhagic Stroke	76	61	62	77	63	76	67	61
Total Number of Stroke Hospitalizations	429	357	349	403	376	372	361	354
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	71	64	49	77	59	55	66	63
Discharged to a Continuing Care Facility	49	32	40	33	49	38	26	23
Hospitalized Hemorrhagic Stroke								
Died	36	24	32	35	16	32	28	17
Discharged to a Continuing Care Facility		8				8		
Readmission								
Hospitalized Ischemic Stroke								
Died								
Discharged to a Continuing Care Facility								
Hospitalized Hemorrhagic Stroke								
Died								
Discharged to a Continuing Care Facility								
Recurrence								
Hospitalized Ischemic Stroke								
Died	13	9	11	9	7	14	11	6
Discharged to a Continuing Care Facility	5	9	7	8	7	6	6	6
Hospitalized Hemorrhagic Stroke								
Died								
Discharged to a Continuing Care Facility								
Total Hospitalized Ischemic Stroke								
Died	88	74	62	87	66	70	77	72
Discharged to a Continuing Care Facility	55	44	47	44	57	44	32	30
Death and Disability	143	118	109	131	123	114	109	102
Total Hospitalized Hemorrhagic Stroke								
Died	37	26	32	38	20	36	31	17
Discharged to a Continuing Care Facility		9		6		9		
Death and Disability	39	35	36	44	24	45	34	21
Total Number of Stroke Hospitalizations								
Died	125	100	94	125	86	106	108	89
Discharged to a Continuing Care Facility	57	53	51	50	61	53	35	34
Death and Disability	182	153	145	175	147	159	143	123
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	23.8%	25.9%	20.6%	28.1%	21.2%	22.6%	26.5%	25.2%
Discharged to a Continuing Care Facility	16.4%	13.0%	16.8%	12.0%	17.6%	15.6%	10.4%	9.2%
Hospitalized Hemorrhagic Stroke								
Died	52.2%	44.4%	53.3%	50.7%	30.2%	46.4%	45.2%	31.5%
Discharged to a Continuing Care Facility	2.9%	14.8%	5.0%	5.8%	7.5%	11.6%	4.8%	7.4%
Readmission								
Hospitalized Ischemic Stroke								
Died	44.4%	10.0%	28.6%	14.3%	0.0%	14.3%	0.0%	50.0%
Discharged to a Continuing Care Facility	11.1%	30.0%	0.0%	42.9%	33.3%	0.0%	0.0%	16.7%
Hospitalized Hemorrhagic Stroke								
Died	0.0%		0.0%		50.0%	0.0%		0.0%
Discharged to a Continuing Care Facility	0.0%		0.0%		0.0%	100.0%		0.0%
Recurrence								
Hospitalized Ischemic Stroke								
Died	28.3%	23.1%	26.2%	20.0%	21.9%	30.4%	26.2%	16.2%
Discharged to a Continuing Care Facility	10.9%	23.1%	16.7%	17.8%	21.9%	13.0%	14.3%	16.2%
Hospitalized Hemorrhagic Stroke								
Died	20.0%	28.6%	0.0%	37.5%	33.3%	66.7%	60.0%	0.0%
Discharged to a Continuing Care Facility	0.0%	14.3%	100.0%	25.0%	0.0%	0.0%	0.0%	0.0%
Total Hospitalized Ischemic Stroke								
Died	24.9%	25.0%	21.6%	26.7%	21.1%	23.6%	26.2%	24.6%
Discharged to a Continuing Care Facility	15.6%	14.9%	16.4%	13.5%	18.2%	14.9%	10.9%	10.2%
Death and Disability	40.5%	39.9%	38.0%	40.2%	39.3%	38.5%	37.1%	34.8%
Total Hospitalized Hemorrhagic Stroke								
Died	48.7%	42.6%	51.6%	49.4%	31.7%	47.4%	46.3%	27.9%
Discharged to a Continuing Care Facility	2.6%	14.8%	6.5%	7.8%	6.3%	11.8%	4.5%	6.6%
Death and Disability	51.3%	57.4%	58.1%	57.1%	38.1%	59.2%	50.7%	34.4%
Total Number of Stroke Hospitalizations								
Died	29.1%	28.0%	26.9%	31.0%	22.9%	28.5%	29.9%	25.1%
Discharged to a Continuing Care Facility	13.3%	14.8%	14.6%	12.4%	16.2%	14.2%	9.7%	9.6%
Death and Disability	42.4%	42.9%	41.5%	43.4%	39.1%	42.7%	39.6%	34.7%

* Age 20 and older

Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (Ischemic or hemorrhagic), which are considered readmissions.

NORTH VANCOUVER ISLAND HSDA

Indicators and Metrics

NORTH VANCOUVER ISLAND HSDA INDICATORS AND METRICS AS OF NOVEMBER 2010

Acute Cerebrovascular Syndrome									
Adults* Residing in the North Vancouver Island HSDA									
2001/02 to 2008/09									
	Fiscal Year								% Change 01/02 to 08/09
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	
Number of Incident ACVS Patients									
Hospitalized Ischemic Stroke	110	123	103	110	127	126	119	107	-2.7%
Hospitalized Hemorrhagic Stroke	29	25	15	17	25	18	28	31	6.9%
Sub-total	139	148	118	127	152	144	147	138	-0.7%
Hospitalized TIA	37	36	43	52	35	22	40	32	-13.5%
Non-hospitalized TIA/Stroke	108	104	121	119	115	132	167	137	26.9%
Sub-total	145	140	164	171	150	154	207	169	16.6%
Number of Prevalent ACVS Patients									
Hospitalized Ischemic Stroke	617	658	670	700	744	783	821	850	37.8%
Hospitalized Hemorrhagic Stroke	128	137	134	137	151	149	170	187	46.1%
Sub-total	745	795	804	837	895	932	991	1,037	39.2%
Hospitalized TIA	344	353	359	373	380	358	367	376	9.3%
Non-hospitalized TIA/Stroke	675	723	782	842	892	963	1,028	1,076	59.4%
Sub-total	1,019	1,076	1,141	1,215	1,272	1,321	1,395	1,452	42.5%
Age-Standardized Incidence / 1,000 Population									
Hospitalized Ischemic Stroke	1.037	1.104	0.902	0.910	1.012	0.960	0.859	0.756	-27.1%
Hospitalized Hemorrhagic Stroke	0.258	0.214	0.118	0.143	0.205	0.154	0.223	0.193	-25.1%
Sub-total	1.303	1.325	1.025	1.058	1.224	1.119	1.088	0.959	-26.4%
Hospitalized TIA	0.342	0.319	0.372	0.428	0.279	0.171	0.287	0.218	-36.3%
Non-hospitalized TIA/Stroke	0.996	0.931	1.072	1.014	0.929	1.022	1.253	1.003	0.7%
Age-Standardized Prevalence / 1,000 Population									
Hospitalized Ischemic Stroke	5.426	5.567	5.441	5.441	5.567	5.618	5.647	5.575	2.8%
Hospitalized Hemorrhagic Stroke	1.087	1.117	1.050	1.050	1.130	1.092	1.198	1.263	16.2%
Sub-total	6.513	6.683	6.491	6.492	6.697	6.710	6.845	6.838	5.0%
Hospitalized TIA	3.014	2.974	2.902	2.880	2.842	2.577	2.535	2.478	-17.8%
Non-hospitalized TIA/Stroke	6.263	6.421	6.672	6.960	7.077	7.266	7.441	7.471	19.3%
Conversion Rate from TIA/Non-hospitalized Stroke to Hospitalized Stroke									
90-Day Conversion Rate					3.42%	4.58%	3.45%		
365-Day Conversion Rate		5.22%	3.18%	3.05%	6.16%	5.23%	3.45%		
Utilization of tPA by Incident Acute Ischemic Stroke Patients									
Number Receiving tPA						3	5	7	
Total Number						126	119	107	
Proportion of Incident Hospitalized AIS Patients Receiving tPA						<u>2.38%</u>	4.20%	6.54%	
Utilization of Acute Care by Incident Ischemic Stroke Patients									
Discharges	110	123	103	110	127	126	119	107	-2.7%
ALOS	34.95	38.76	26.78	23.97	32.54	29.23	25.03	27.60	-21.0%
Patient Days	3,844	4,768	2,758	2,637	4,133	3,683	2,978	2,953	-23.2%
Utilization of Acute Care by Incident Hemorrhagic Stroke Patients									
Discharges	30	25	15	18	25	19	28	31	3.3%
ALOS	28.53	12.36	27.73	38.00	20.80	7.89	14.89	11.74	-58.8%
Patient Days	856	309	416	684	520	150	417	364	-57.5%
Discharge Disposition following Acute Admissions for Incident Ischemic Stroke Patients									
Died	21.8%	22.8%	22.3%	26.4%	23.6%	23.8%	25.2%	23.4%	7.1%
Discharged to Home	59.1%	59.3%	59.2%	55.5%	57.5%	47.6%	52.1%	49.5%	-16.2%
Home with Support Services	7.3%	4.9%	<u>3.9%</u>	6.4%	5.5%	12.7%	15.1%	13.1%	79.9%
Continuing Care Facility	10.9%	9.8%	9.7%	8.2%	11.8%	7.9%	4.2%	9.3%	-14.3%
Other	<u>0.9%</u>	<u>3.3%</u>	4.9%	<u>3.6%</u>	<u>1.6%</u>	7.9%	<u>3.4%</u>	4.7%	414.0%
Discharge Disposition following Acute Admissions for Incident Hemorrhagic Stroke Patients									
Died	40.0%	40.0%	26.7%	50.0%	40.0%	42.1%	32.1%	58.1%	45.2%
Discharged to Home	43.3%	52.0%	73.3%	27.8%	52.0%	52.6%	50.0%	32.3%	-25.6%
Home with Support Services				<u>11.1%</u>	<u>4.0%</u>		<u>3.6%</u>	<u>6.5%</u>	
Continuing Care Facility	<u>6.7%</u>	<u>4.0%</u>					<u>3.6%</u>	<u>3.2%</u>	-51.6%
Other	<u>10.0%</u>	<u>4.0%</u>		<u>11.1%</u>	<u>4.0%</u>	<u>5.3%</u>	<u>10.7%</u>		
Mortality Following an Incident Stroke									
Hospitalized Ischemic Stroke									
Crude 30-day In-hospital Mortality Rate	18.2%	16.3%	17.5%	19.1%	18.9%	19.8%	20.2%	19.6%	7.9%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	21.1%	21.4%	15.3%	19.1%	19.4%	19.8%	15.8%	18.6%	-11.9%
Hospitalized Hemorrhagic Stroke									
Crude 30-day In-hospital Mortality Rate	37.9%	40.0%	<u>26.7%</u>	52.9%	40.0%	44.4%	32.1%	58.1%	53.1%
Crude 31-365 Day Mortality Rate in 30-day In-hospital Survivors	11.1%	20.0%	0.0%	0.0%	6.7%	10.0%	10.5%	23.1%	107.7%

Grey Shading = Not Applicable/Available
Underlined % are based on a numerator of less than 5

* Age 20 and older

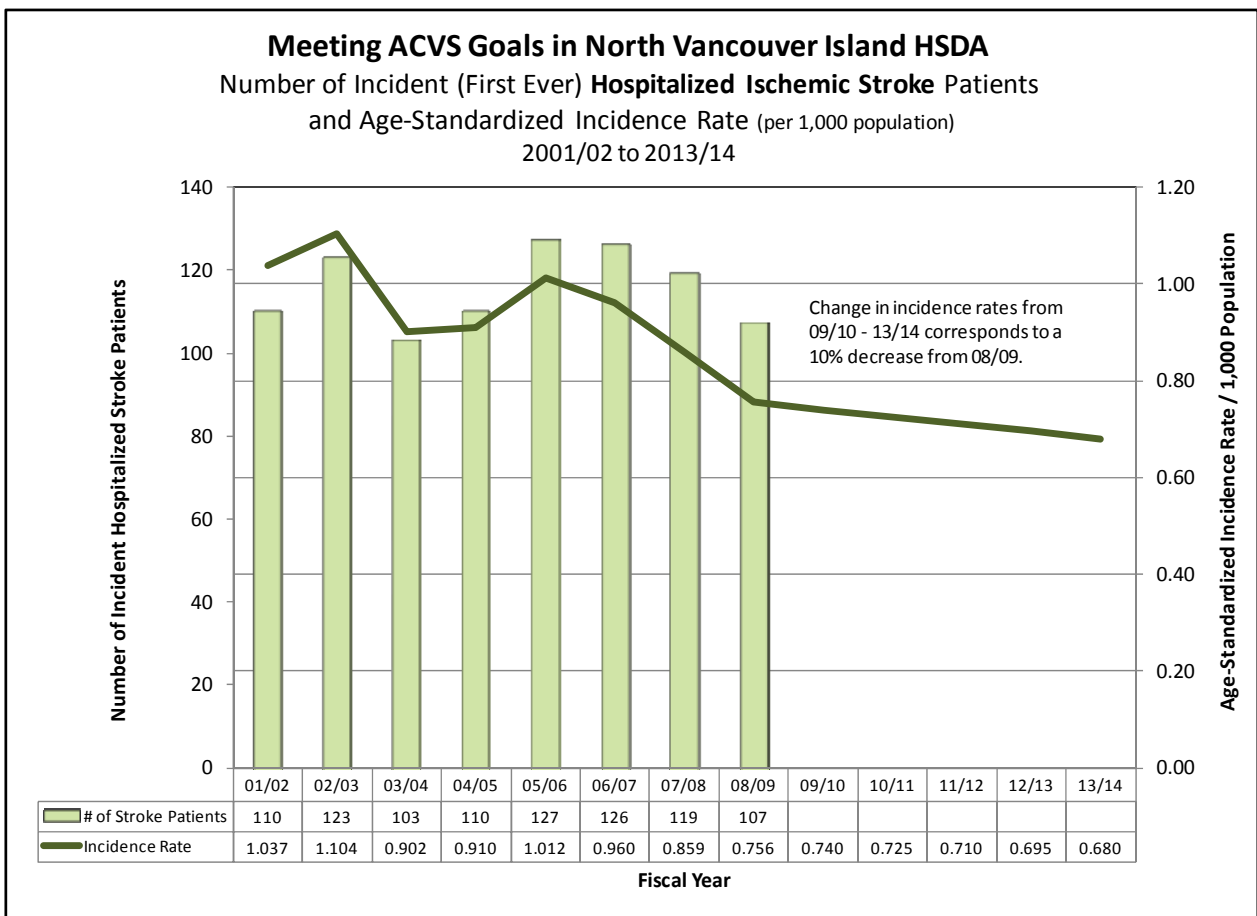
NORTH VANCOUVER ISLAND HSDA INDICATORS AND METRICS

The BC Stroke Strategy Measurement and Evaluation Working Group have suggested five key indicators for tracking progress on ACVS care in the province. The following charts and tables include trend data for **North Vancouver Island HSDA** for three of these five indicators. The source of this data is from the updated Acute Cerebrovascular Syndrome (ACVS) Registry. Note that the geographic location is based on the patient's residence, not necessarily the location of their treatment.

Indicator #3 – Incidence Rate

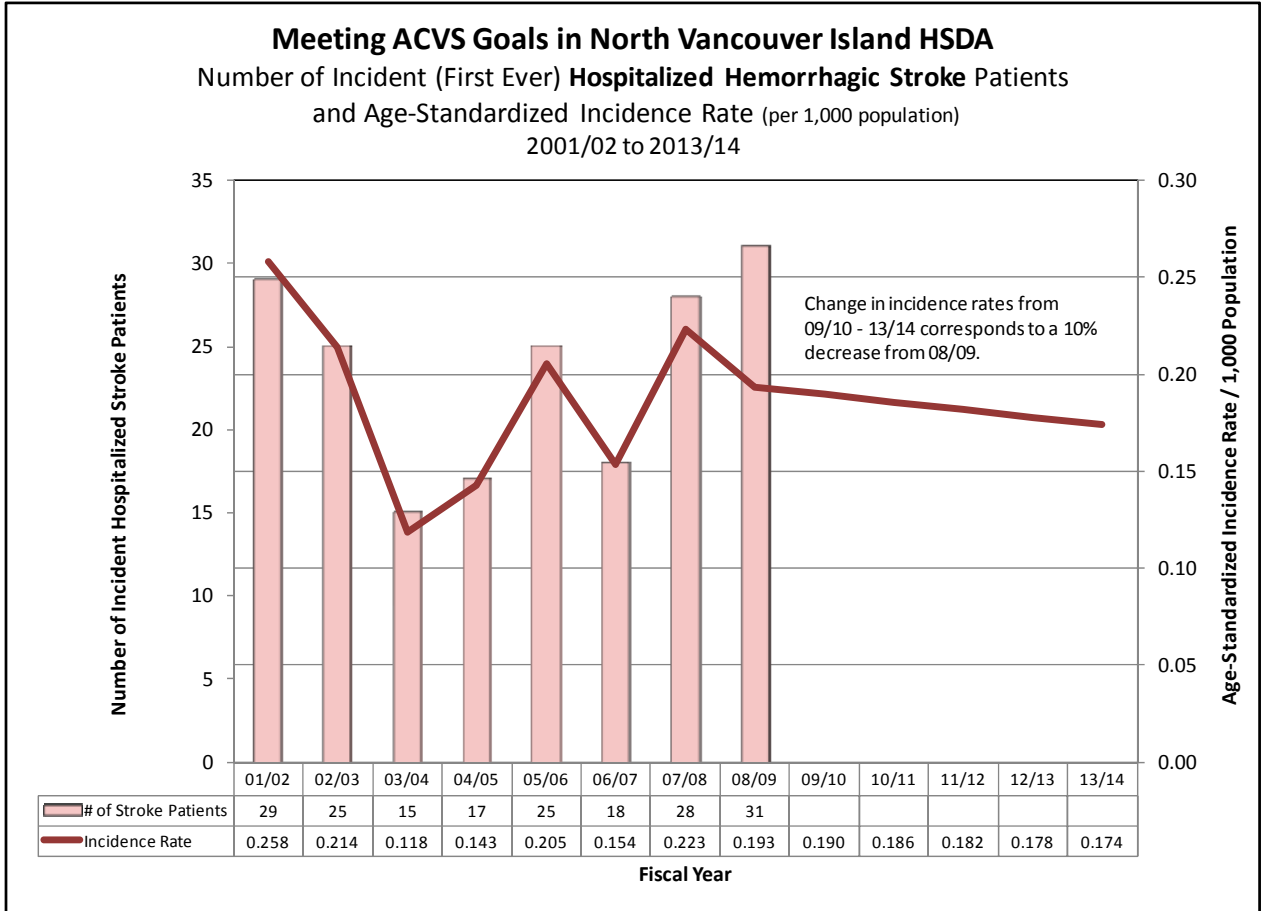
Reduce the age-standardized incidence rate of both ischemic and hemorrhagic stroke by **10%** between 2008/09 and 2013/14 (*data source*: updated ACVS Registry).

North Vancouver Island HSDA – Incident Hospitalized Ischemic Stroke Patients



Indicator #3 – Incidence Rate (continued)

North Vancouver Island HSDA – Incident Hospitalized Hemorrhagic Stroke Patients

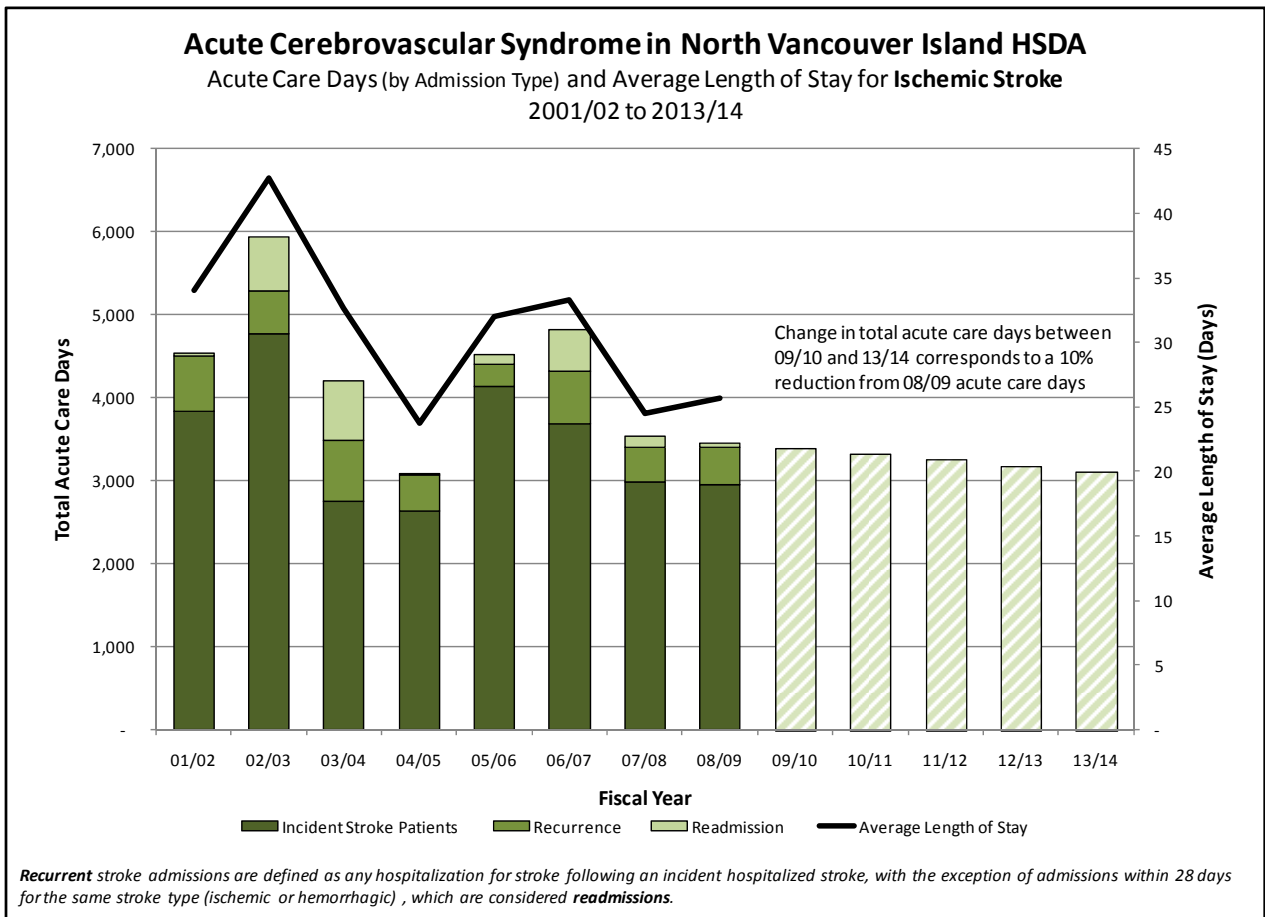


Indicator #4 – Acute Care Days

Reduce acute care days for discharges in which an ischemic stroke is the principal diagnosis by **10%** between 2008/09 and 2013/14 (this includes a combination of reduced discharges and reduced average length of stay).

Data Source: Updated ACVS Registry for incident, re-admit and recurrent ischemic stroke discharges. Link to the Discharge Abstract Database (DAD) for number of hospital days associated with these discharges. **Recurrent** stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered **readmissions**.

North Vancouver Island HSDA – Acute Care Days and ALOS for Ischemic Stroke Patients



Indicator #4 – Acute Care Days (continued)

North Vancouver Island HSDA – Hospitalization and ALOS Data Trends

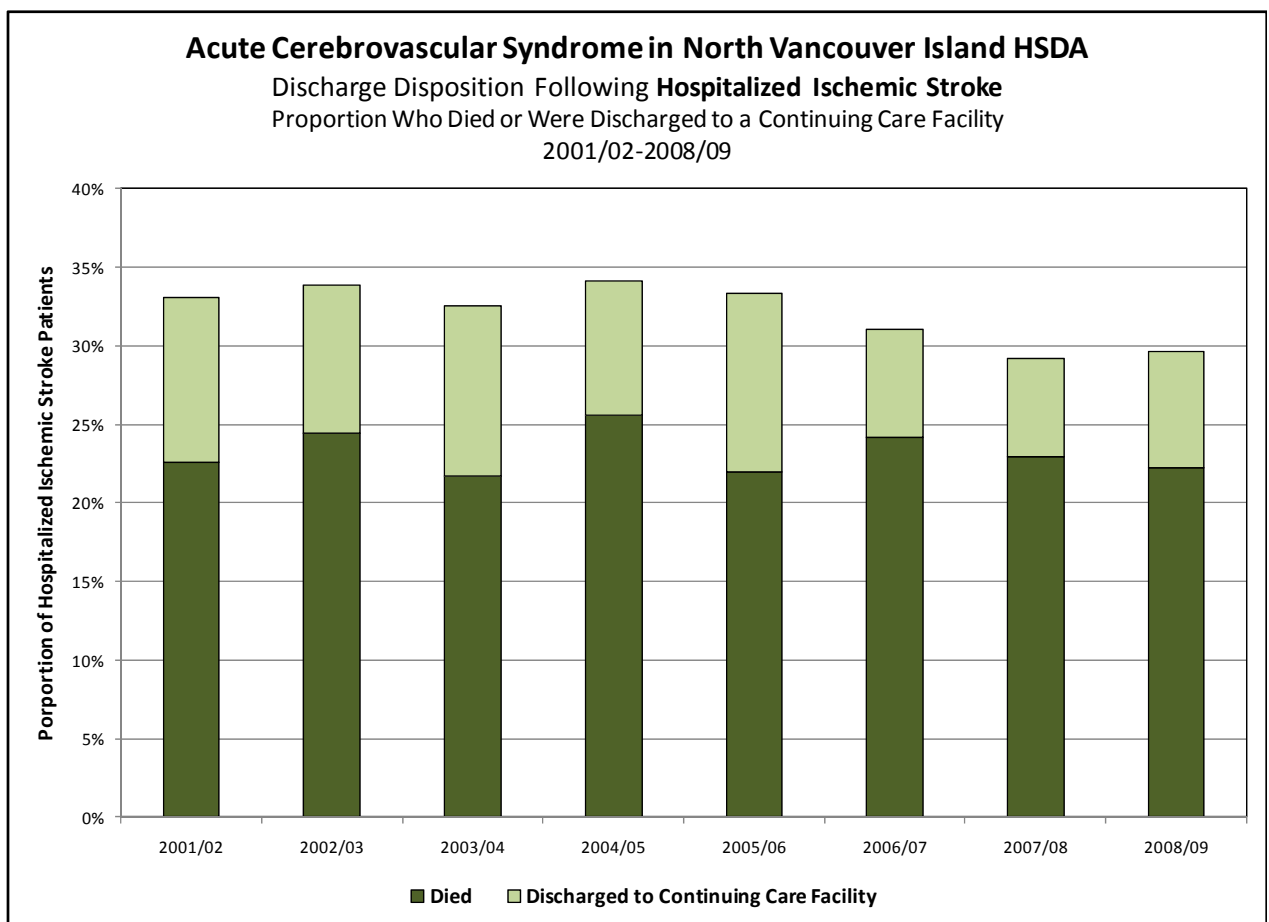
Hospitalization and ALOS for Stroke								
Adults* Residing in North Vancouver Island HSDA								
2001/02 to 2008/09								
	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	110	123	103	110	127	126	119	107
Hospitalized Hemorrhagic Stroke	30	25	15	18	25	19	28	31
Readmission								
Hospitalized Ischemic Stroke								8
Hospitalized Hemorrhagic Stroke								-
Recurrence								
Hospitalized Ischemic Stroke	22	12	22	18	11	15	21	20
Hospitalized Hemorrhagic Stroke	-							
Total Hospitalized Ischemic Stroke	133	139	129	129	141	145	144	135
Total Hospitalized Hemorrhagic Stroke	32	29	17	19	27	21	32	33
Total Number of Stroke Hospitalizations	165	168	146	148	168	166	176	168
Average Length of Stay in Acute Care								
Incident Stroke Patients								
Hospitalized Ischemic Stroke	34.95	38.76	26.78	23.97	32.54	29.23	25.03	27.60
Hospitalized Hemorrhagic Stroke	28.53	12.36	27.73	38.00	20.80	7.89	14.89	11.74
Readmission								
Hospitalized Ischemic Stroke	26.00	164.25	181.25	3.00	37.00	126.75	30.75	7.00
Hospitalized Hemorrhagic Stroke	54.50	5.00	1.00			1.00	13.50	
Recurrence								
Hospitalized Ischemic Stroke	29.95	42.58	32.91	23.67	24.64	42.33	20.38	22.60
Hospitalized Hemorrhagic Stroke		5.67	1.00	1.00	98.00	20.00	84.00	8.50
Total Hospitalized Ischemic Stroke	34.05	42.71	32.61	23.77	32.02	33.28	24.51	25.64
Total Hospitalized Hemorrhagic Stroke	30.16	11.41	24.59	36.05	26.52	8.14	19.13	11.55
Total Number of Stroke Hospitalizations	33.30	37.30	31.68	25.34	31.14	30.10	23.53	22.87
Days in Acute Care								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	3,844	4,768	2,758	2,637	4,133	3,683	2,978	2,953
Hospitalized Hemorrhagic Stroke	856	309	416	684	520	150	417	364
Readmission								
Hospitalized Ischemic Stroke	26	657	725			111	507	123
Hospitalized Hemorrhagic Stroke	109			-	-			27
Recurrence								
Hospitalized Ischemic Stroke	659	511	724	426	271	635	428	452
Hospitalized Hemorrhagic Stroke	-	17			196	20	168	17
Total Days - Hospitalized Ischemic Stroke	4,529	5,936	4,207	3,066	4,515	4,825	3,529	3,461
Total Days - Hospitalized Hemorrhagic Stroke	965	331	418	685	716	171	612	381
Total Days	5,494	6,267	4,625	3,751	5,231	4,996	4,141	3,842
* Age 20 and older								
<i>Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.</i>								

Indicator #5 – Death and Dependency

Reduce the proportion of patients who die in hospital or are sent to a long- term care facility after being admitted/discharged (principal diagnosis) for ischemic stroke. *If only one composite measure is used to assess progress in stroke care, it would be this overall measure of death and dependency.*

Data Source: Updated ACVS Registry for hospitalized (incident, readmission and recurrent) ischemic stroke discharges. DAD for discharge disposition ('died', 'discharged to a Continuing Care facility').

North Vancouver Island HSDA – Discharge Disposition for Hospitalized Ischemic Stroke



Discharge Disposition Following a Hospitalization for Stroke

Patient Died or Was Discharged to a Continuing Care Facility

Adults* Residing in North Vancouver Island HSDA

2001/02 to 2008/09

	Fiscal Year							
	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
Number of Stroke Hospitalizations								
Number of Incident Stroke Patients								
Hospitalized Ischemic Stroke	110	123	103	110	127	126	119	107
Hospitalized Hemorrhagic Stroke	30	25	15	18	25	19	28	31
Readmission								
Hospitalized Ischemic Stroke								8
Hospitalized Hemorrhagic Stroke								-
Recurrence								
Hospitalized Ischemic Stroke	22	12	22	18	11	15	21	20
Hospitalized Hemorrhagic Stroke	-							
Total Hospitalized Ischemic Stroke	133	139	129	129	141	145	144	135
Total Hospitalized Hemorrhagic Stroke	32	29	17	19	27	21	32	33
Total Number of Stroke Hospitalizations	165	168	146	148	168	166	176	168
Discharge Disposition - Number								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	24	28	23	29	30	30	30	25
Discharged to a Continuing Care Facility	12	12	10	9	15	10	5	10
Hospitalized Hemorrhagic Stroke								
Died	12	10		9	10	8	9	18
Discharged to a Continuing Care Facility								
Readmission								
Hospitalized Ischemic Stroke								
Died	-							
Discharged to a Continuing Care Facility	-							
Hospitalized Hemorrhagic Stroke								
Died	-							
Discharged to a Continuing Care Facility	-							
Recurrence								
Hospitalized Ischemic Stroke								
Died	6	5				5		5
Discharged to a Continuing Care Facility								
Hospitalized Hemorrhagic Stroke								
Died	-							
Discharged to a Continuing Care Facility	-							
Total Hospitalized Ischemic Stroke								
Died	30	34	28	33	31	35	33	30
Discharged to a Continuing Care Facility	14	13	14	11	16	10	9	10
Death and Disability	44	47	42	44	47	45	42	40
Total Hospitalized Hemorrhagic Stroke								
Died	12	12		10	11	9	10	19
Discharged to a Continuing Care Facility								
Death and Disability	14	13		10	11	9	12	20
Total Number of Stroke Hospitalizations								
Died	42	46	32	43	42	44	43	49
Discharged to a Continuing Care Facility	16	14	14	11	16	10	11	11
Death and Disability	58	60	46	54	58	54	54	60
Discharge Disposition - Proportion								
Incident Stroke Patients								
Hospitalized Ischemic Stroke								
Died	21.8%	22.8%	22.3%	26.4%	23.6%	23.8%	25.2%	23.4%
Discharged to a Continuing Care Facility	10.9%	9.8%	9.7%	8.2%	11.8%	7.9%	4.2%	9.3%
Hospitalized Hemorrhagic Stroke								
Died	40.0%	40.0%	26.7%	50.0%	40.0%	42.1%	32.1%	58.1%
Discharged to a Continuing Care Facility	6.7%	4.0%	0.0%	0.0%	0.0%	0.0%	3.6%	3.2%
Readmission								
Hospitalized Ischemic Stroke								
Died	0.0%	25.0%	25.0%	0.0%	33.3%	0.0%	50.0%	0.0%
Discharged to a Continuing Care Facility	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	25.0%	0.0%
Hospitalized Hemorrhagic Stroke								
Died	0.0%	0.0%	0.0%			100.0%	0.0%	
Discharged to a Continuing Care Facility	0.0%	0.0%	0.0%			0.0%	0.0%	
Recurrence								
Hospitalized Ischemic Stroke								
Died	27.3%	41.7%	18.2%	22.2%	0.0%	33.3%	4.8%	25.0%
Discharged to a Continuing Care Facility	9.1%	8.3%	13.6%	11.1%	9.1%	0.0%	14.3%	0.0%
Hospitalized Hemorrhagic Stroke								
Died		66.7%	0.0%	100.0%	50.0%	0.0%	50.0%	50.0%
Discharged to a Continuing Care Facility		0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%
Total Hospitalized Ischemic Stroke								
Died	22.6%	24.5%	21.7%	25.6%	22.0%	24.1%	22.9%	22.2%
Discharged to a Continuing Care Facility	10.5%	9.4%	10.9%	8.5%	11.3%	6.9%	6.3%	7.4%
Death and Disability	33.1%	33.8%	32.6%	34.1%	33.3%	31.0%	29.2%	29.6%
Total Hospitalized Hemorrhagic Stroke								
Died	37.5%	41.4%	23.5%	52.6%	40.7%	42.9%	31.3%	57.6%
Discharged to a Continuing Care Facility	6.3%	3.4%	0.0%	0.0%	0.0%	0.0%	6.3%	3.0%
Death and Disability	43.8%	44.8%	23.5%	52.6%	40.7%	42.9%	37.5%	60.6%
Total Number of Stroke Hospitalizations								
Died	25.5%	27.4%	21.9%	29.1%	25.0%	26.5%	24.4%	29.2%
Discharged to a Continuing Care Facility	9.7%	8.3%	9.6%	7.4%	9.5%	6.0%	6.3%	6.5%
Death and Disability	35.2%	35.7%	31.5%	36.5%	34.5%	32.5%	30.7%	35.7%

* Age 20 and older

Recurrent stroke admissions are defined as any hospitalization for stroke following an incident hospitalized stroke, with the exception of admissions within 28 days for the same stroke type (ischemic or hemorrhagic), which are considered readmissions.

Indicator #5 – Death and Dependency (continued)

North Vancouver Island HSDA – Discharge Disposition Data Trends