

PROVINCIAL STATUS REPORT: ONTARIO STROKE SYSTEM

Provincial Steering Committee, Ontario Stroke System
May 2006

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Introduction

Stroke, a complex disease, is a devastating and potentially debilitating condition. Recent statistics indicate that approximately 100,000 Ontarians live with the effects of stroke and costs to the health care system are approaching \$1 billion. The Ontario Stroke System (OSS), a province-wide comprehensive approach to organize care for stroke across the continuum, recognizes the potential to significantly change the outcomes for those who are at risk for, or who suffer a stroke. The OSS began as a demonstration initiative and is now funded by the Ministry of Health and Long-Term Care (MOHLTC) to increase the system's efficiency at responding to stroke and its effects. The commitment of \$30 million per year has enabled development of eleven regional stroke networks across Ontario, with the goal of ensuring access to timely and appropriate, evidence-based stroke care. Stroke regions designated by the MOHLTC have made significant progress towards integration of supports and services aimed at preventing and responding to stroke province-wide.

The 2005/06 fiscal year saw the full allocation of the \$30 million annually committed by the provincial government for the purpose of regional stroke development. The last of the incremental allotments marked a transition to the Ontario Stroke System and, with it, a shift to regional responsibility for ensuring the appropriate governance, leadership and infrastructure supports to further develop stroke services integration across the continuum of care. Stroke systems span primary and secondary prevention (including health promotion efforts targeting the health of the Ontario population), symptom recognition/response, emergency care, acute care, rehabilitation and community re-engagement, with the aim of enabling seamless transitions and optimal outcomes for stroke survivors and their families. Early advancements in stroke system building occurred in a step-wise fashion. Developments in emergency and acute response to stroke were soon followed by those in secondary prevention, long-term and community stroke care. More recently, attention has been directed to ensuring advancements in the areas of stroke rehabilitation and prevention. While progress has been significant, work is continuing. Across the province, stakeholders are working together and successes are evident. But the Ontario Stroke System is not yet fully developed.

The purpose of this report is to draw attention to the opportunities for continued stroke care integration, in light of the successes that have been achieved.

Opportunities

A Continuing Vision

This is an ideal time to focus attention on the current and future directions of the Ontario Stroke System. While regions now are autonomous and each will chart its own course for continuing and sustaining stroke activities, it is necessary to harmonize efforts across the province.

There is need for an overarching provincial vision for the Ontario Stroke System that continues to take stock of successes and forecast future needs, while at the same time acknowledging region-specific realities. The transformation agenda of the MOHTLC coupled with the evolution of Local Health Integration Networks (LHINs) mean that policy frameworks to support the growing Ontario Stroke System will continue to be important and necessary. The establishment of LHINs will benefit the OSS through their role in health system planning, coordination and funding and they will ensure a common voice within communities. In turn, the OSS can provide valuable insights to the LHINs, sharing many of the lessons that have been learned about integrated system building and the engagement of community partners.

There are opportunities to create additional linkages with the MOHLTC, recognizing that stroke spans a number of this government's current priorities and initiatives. The many parallels present good opportunities to build with others. For example, the evaluation of the OSS Implementation Phase (2000-2004) concludes that the OSS is a successful example of a chronic disease management model.¹ It presents a model for seamless disease prevention and management throughout the continuum of care, promoting best practices. The government's commitment to proactive approaches to health care and to strategies that keep people well and prevent diseases from occurring suggest that the OSS aligns well with the Chronic Disease Management and Prevention Framework of the MOHLTC. The framework incorporates both primary and secondary prevention initiatives aimed to keep people healthy. Its intended collaborations to ensure quality, evidence-based care present a further opportunity for the OSS to strengthen its various components and to enhance its linkages with the primary care community. Indeed, the OSS has identified the need to better engage primary care practitioners to communicate prevention best practices and the role of secondary stroke prevention. Hence, a formalized connection to the Chronic Disease Management and Prevention Framework of the MOHLTC will prove valuable.

There are opportunities to extend linkages with government's existing structures and to capitalize on relationships, for example with the Ministry of Health Promotion. Important initiatives are those which encourage active and sound lifestyle choices and which create environments in communities to reduce stroke incidence. Indeed, \$4.6 million has been allocated to the OSS for health promotion initiatives and it is timely to continue building on successes to make further strides for stroke prevention and leverage learnings for prevention of other chronic diseases.

Shared Understandings

Increasingly there is much being learned and understood about brain disorders and mechanisms for neural recovery. Certainly there are opportunities to apply this knowledge to the many conditions that affect the brain, stroke being but one. With an improved understanding of treatment needs and potential interdisciplinary approaches that might be applied when there are cognitive, behavioural and memory changes, many survivors of stroke and other conditions can benefit. There are promising opportunities to coalesce approaches, for example between Alzheimer, Acquired Brain Injury and stroke populations. There are further opportunities to build shared and common assessments and data bases so that clinical care can be optimized across the continuum, while at the same time system efficiencies can be achieved.

Linking stroke with other vascular diseases appears to be another promising opportunity. The common risk factors of physical inactivity, unhealthy diets and smoking can be addressed in a coordinated way.

¹ *Achievements of the Ontario Stroke System 2000-2004*. Stroke Evaluation Advisory Committee (SEAC). Ontario Stroke System. Ontario Ministry of Health and Long-Term Care. October 2005.

Findings from recent cardiac care focus groups sponsored by the Heart and Stroke Foundation of Ontario and the Cardiac Care Network, underscore that participants from across LHINs and Ontario communities see the need for a more integrated approach to chronic disease prevention and management.

Stroke System Development Across the Continuum

A significant portion of the funds allocated to the OSS are directed towards regions' development of coordinated care approaches for stroke across the full continuum of care. There have been many gains, but there are gaps that need to be addressed.

Health Promotion and Primary Prevention

Demographic and population data have projected increases in stroke due to the aging population. The prevention-focused efforts of the OSS are beginning to show a reversal to this forecast. The province has seen an 11.2% decrease from 1997/98 to 2002/03 in the number of patients hospitalized for stroke. Among the positive steps in prevention is the development of stronger relationships with the health promotion community.

Initiatives that promote health are relevant for stroke prevention when they target the factors that increase the risk of stroke. For example, *Walk this Way* (WTW) is a set of self-help program materials intended to assist men and women, ages 20-64, in beginning and adhering to a walking regimen to increase their physical activity levels. Through the OSS, WTW has been re-designed and made available to individuals across Ontario through Public Health Units, with further investigation underway of how to best offer WTW through workplaces, First Nations groups and primary care settings.

High blood pressure is a known significant risk factor for stroke. An exciting initiative has resulted in development of an important tool, the Blood Pressure Action Plan™. It is a web-based tool that includes a follow up program, providing users with supportive email related to risk factors and readiness for change. To this point in time, there have been almost 109,000 general population users. The Cardiovascular Health Awareness Program of the OSS (CHAP-OSS) is another innovation that targets hypertension and stroke prevention. It is a community-based undertaking that mobilizes community organizations and agencies, family physicians, pharmacists, community health nurses, volunteers and community-dwelling seniors aged 65 years and older for the purpose of raising awareness of the importance of monitoring and controlling high blood pressure as well as managing other modifiable risk factors, for the prevention of stroke and cardiovascular disease.

A best practice guideline, *Nursing Management of Hypertension*, was developed in partnership with the Registered Nurses Association of Ontario. This guideline, containing recommendations on best practices in nursing care for adults with hypertension, is intended to be used by nurses who are not necessarily experts in the management of hypertension. The nursing guideline can be used in a variety of care settings including primary care practices and secondary prevention clinics.

Recent project work in collaboration with the Ontario College of Family Physicians recognizes that primary care practitioners have an important role to play in primary prevention of strokes. Tools and supports are now being developed for family doctors and other primary care providers to enhance their ability to provide both primary and secondary stroke prevention services and quality stroke care.

Secondary Prevention

Notable successes are evident in stroke secondary prevention initiatives. Secondary Prevention Clinics for stroke have resulted in a six-fold increase in the urgent management of TIAs from emergency departments. This is critical because there is a high risk of stroke following TIA, estimated to be between 10-20% in the 90 days post-TIA². The proportion of patients with stroke-related diagnoses who are discharged from emergency departments of Regional Stroke Centres to Secondary Prevention Clinics has risen from 9% to 63%. These specialized clinics have the potential to reduce stroke incidence and stroke recurrence. In addition to the decrease in hospital stroke admissions mentioned above, one-year readmission rates for stroke and TIAs fell by a factor of 17% from 9% to 7.5% from 1997/98 to 2002/03. With the increase in stroke prevention clinic designations and a concerted effort across the province to improve access to timely secondary stroke prevention, the stroke re-admission rate is expected to continue to fall. Existing OSS-funded Secondary Prevention Clinics demonstrate increased access to medical expertise, patient and family education, as well as leadership in stroke care. At the present time, there are more than fifty stroke specialist physicians (non-neurologists) who are providing specialized stroke care in both urban and rural areas of the province. While there are significant successes, gaps remain. As the LHINs begin to shape their work plans, there is the opportunity for each to consider regional gaps and pressures on local areas with respect to access to stroke services and adequate capacity for secondary prevention, for example, shortages in access to primary care, inequity in access to diagnostics, and limited funding for data collection are issues that create regional and local barriers to secondary prevention services.

The development of OSS-funded Stroke Secondary Prevention Clinics enables the work-up for individuals diagnosed with Transient Ischaemic Attacks (TIA). Most individuals can be assessed and receive treatment, support and management of their condition in the community. This means that where Secondary Prevention Clinics exist in some parts of the province, patients can be sent home from the emergency department with a follow-up clinic visit scheduled within a short period of time. Hence, some admissions to hospital can be avoided. This results in improved processes of care for both patients and providers and is cost effective. Among the priority activities in secondary prevention is the need to continue to standardize processes across clinics in order to derive clinic protocols, further clarify the criteria for TIA hospital admission, ensure efficient care processes and enable the development of education resources that support secondary prevention.

Secondary Prevention Clinics provide the opportunity for appropriate patients to access essential diagnostics and care approaches such as carotid revascularization. To ensure continued timely access to care, carotid revascularization may be an ideal case for inclusion in Ontario's Wait Time Strategy.

The OSS foci on primary and secondary prevention present ideal opportunities to integrate stroke with existing vascular prevention initiatives. Stroke secondary prevention activities can readily link with health promotion best practices and healthy lifestyle choices, both being current priorities of the MOHLTC and the Ministry of Health Promotion.

Stroke Recognition and Emergency Response

Public awareness campaigns launched by the Heart and Stroke Foundation of Ontario have demonstrated that more people recognize the warning signs of stroke. Rapid response to the stroke warning signs, by

² Hill MD & Gladstone DJ. Patients With TIA or Minor Stroke Should Be Admitted to Hospital. *Stroke* 2006;37:1137-1138.

calling 911 or accessing appropriate emergency medical services for hospital care, is essential. When stroke patients reach emergency care within a “critical window” after symptom onset, there is a high likelihood that significantly improved clinical outcomes can be achieved. Continuing efforts to increase public awareness and rapid response to the signs and symptoms of stroke are crucial.

Survey results from April 2006 illustrate that public awareness of two or more stroke warning signs increased to 68% from 64% reported for February 2006. The previous advertising campaign which ended in August 2005 showed awareness at 72%. The six-month black out period from August 2005 to February 2006 resulted in erosion of awareness levels and during the initial weeks of the current campaign, efforts needed to be directed at re-creating levels of awareness. The advertising agency commissioned by the Heart and Stroke Foundation of Ontario indicated that had there not been a black-out period, levels of awareness would have been higher. By the completion of the recent television advertising campaign which aired February through March 2006, approximately 79% of adults in Ontario aged 45 years or older (representing a population of 3 081 000) were reported to have viewed the advertisement an average of 8.6 times.

Although the recent advertising campaign did not focus on the need for timely response and early arrival to hospital for care, data from the Registry of the Canadian Stroke Network illustrate that the advertising campaign appears to have created these positive results. Since the beginning of the stroke awareness advertising campaign in 2003, there has been a direct correlation between the campaign periods and the number of stroke patients arriving at hospital emergency departments in a timely manner. During the first advertising campaign, the number of stroke patients presenting at Regional Stroke Centre emergency departments increased significantly. During the subsequent blackout period, there was a significant decrease in the total number of cases. Finally, during the second advertising period, the total number of timely stroke arrivals at emergency departments increased again.

Public awareness efforts continue. An extensive review and analysis of the landscape of health communications has accompanied detailed examinations of the “fatigue factor” in the recently completed television advertising campaign related to stroke warning signs. These inputs will inform the development of a new campaign to focus on the risk factors associated with stroke.

Acute Care

Among the key clinical indicators reflecting OSS success in acute stroke response are 7.6% decrease in provincial acute care hospital mortality rates; 11% and 18% decrease in hospitalizations for stroke and for transient ischemic attacks (TIAs), respectively; and a reduction of 2.3 days in hospital length-of-stay. One-year readmission rates for stroke and TIAs fell by a factor of 17% from 9% to 7.5% from 1997/98 to 2002/03. Ontario is the leading jurisdiction in Canada and internationally in terms of improved access to emergency thrombolytic therapy. These successes are largely attributable to the organization of stroke care achieved through the OSS including the introduction of medical redirect protocols and code stroke teams that provide immediate expert care 24/7. Regions have demonstrated the capacity to provide thrombolytic therapy to one in four of the stroke patients that arrive within the 2 ½ hour window. Consequently, hundreds of Ontarians are recovering from strokes that would otherwise have had severe repercussions requiring long-term care.

Across regions, the OSS is based on a three-tiered model that includes Regional Stroke Centres, District Stroke Centres/Enhanced District Stroke Centres³ and community hospitals. Regional and District Stroke Centres/Enhanced District Stroke Centres must meet designation guidelines and 'readiness' requirements based on the current 'gold standard' in acute stroke care. The dedicated resources and complexity of arrangements for Regional Stroke Centres and Enhanced District Stroke Centres are aimed at ensuring full acute care coverage across regions and enabling access to timely care. Indeed, experience and data from the Ontario Stroke Audit indicate that improved access results when the appropriate infrastructure is in place, for example, the increased number of stroke units ensure that more Ontarians are receiving the best possible stroke care.

Data from the Canadian Stroke Network's Ontario Stroke Audit demonstrate that at this time there are disparities across the province and that standardized, high quality stroke care has not yet been realized everywhere. It is important to recognize that the staged designation of RSCs and DSCs/EDSCs meant that different regions were at different stages in the evolution of the OSS and that funding was made available at different times in the history of the OSS. The MOHLTC announced the final stroke designations and allocation of funding in the fall of 2005. There are some remaining gaps, however, that need to be addressed. Specifically, two regions (Central East and North East) did not receive funding for a stroke team. This limits their capacity for outreach efforts that would support the implementation of stroke best practices in community hospitals. A second gap relates to District Stroke Centres, of particular significance is the Durham Region of the GTA. The area represents a sizeable community of Ontarians for whom access to organized stroke services is limited. This suggests that ongoing opportunities ought to be available for reviewing the designation status to order to achieve equity across the province.

Telemedicine for stroke (Telestroke) is a vital component of the OSS and a valuable solution in situations where there are disparities in access to neurology and stroke physician expertise across Ontario. Telestroke successfully improves access to acute stroke interventions. However, experience with Telestroke indicates that an emerging issue is the heavy burden placed on the neurologists who take Telestroke calls. Varying responses to this problem have been derived across regions. An encouraging step is the coming together of three telemedicine networks to form one organization, the Ontario Telehealth Network (OTN). This consolidation presents the opportunity for a coordinated provincial approach to telestroke, technology, further site selection and on-call scheduling. As this work progresses, it will be important for the MOHLTC to consider its support, in order that province-wide timely access to the best stroke care can be ensured. There will be need for a provincial vision for stroke and a plan that considers infrastructure needs, expansion and human resource deployment issues.

Rehabilitation

Rehabilitation is a significant area of concern. One of the major challenges to stroke care integration is the fragmented nature of rehabilitation services. There are diverse models of care. It is of concern that current global funding of hospitals results in uneven support of rehabilitation across hospitals and regions. Further, there is a notable absence of an overarching provincial framework for rehabilitation. One important initiative of the OSS in stroke rehabilitation is the work of a Rehabilitation Consensus Panel. It aims to respond to the need for an overarching framework and system standards in stroke rehabilitation including transitions to and from appropriate rehabilitation settings. Such a framework can assist regional planning, evaluation and performance monitoring and can also inform provincial policy development.

³ Enhanced District Stroke Centres (EDSC) have been established to provide leadership and ensure integration in Ontario regions where the Regional Stroke Centre designation cannot be met. The MOHLTC holds common expectations of both RSCs and EDSCs.

The OSS Rehabilitation Coordinator positions supported through the MOHLTC's final allotment of \$30 million to the OSS will assist to organize a regional approach to stroke rehab. This will permit the sharing of issues and workplans. Further opportunities to forge links provincially are important, so that stroke rehabilitation can be further advanced.

Evaluation findings reflect that, overall, there are alarming variations in survivors' access to rehabilitation across the province. Provincial CIHI acute and rehab data indicate that only 24% of stroke survivors had access to inpatient stroke rehabilitation beds, with variation across MOHLTC regions in 2003/04 of 13% to 32%⁴. At regional stroke centres in 2001/02, an average of only 19% of stroke patients were discharged from acute care to inpatient rehab settings with a variation from 6% to 31%⁵. Although recent data indicate some improving trends in access to inpatient rehabilitation in some areas, the continued variation in access to inpatient, outpatient and community services across the province is a serious and growing threat to quality stroke care. Many community hospitals in the province do not have rehabilitation-designated beds. Reductions in both inpatient and outpatient rehabilitation services in many areas as a result of the Hospital Annual Planning Submission (HAPS) present further challenges. Stroke rehabilitation services are not readily available following a stroke survivor's discharge from acute hospital stay. At present, wait times for services organized through Community Care Access Centres (CCACs) range from 3 to 4 months.

Many organizations across the province have limited or no access to rehabilitation professionals and this challenges the implementation of stroke best practices.

There is need to ensure that rehabilitation services are available for stroke patients in varied settings. It is encouraging that the MOHLTC has taken steps to implement equitable access to OHIP-funded physiotherapy services in long-term care and for seniors over 65 years of age in the community. The experience from a stroke rehabilitation pilot project demonstrates gains in functional status for patients in these settings. These positive results suggest that all rehabilitation services ought to be available, given their potential to be of benefit to stroke survivors.

There is growing evidence that patients recovering from severe stroke (with pronounced disabilities, high dependence and care needs) can benefit from both inpatient and outpatient interdisciplinary rehabilitation. With this care, this subset of stroke patients shows gains and improved quality of life. Institutionalization is prevented and potential system cost savings can be realized.⁶

Community Re-Engagement

Recent efforts of the OSS have concentrated on developing the community re-engagement component of the care continuum. Progress has been achieved in a number of areas. Several CCACs have adopted service guidelines, ensuring consistent approaches to care by their providers. The resource *Tips and Tools for Everyday Living: A Guide for Stroke Caregivers* has been broadly disseminated in the long-term care environment and has been well received. It is the cornerstone for standardized best practices in the long-term care and community sectors. Work has progressed in aphasia and strategies for supported conversation are lauded as successes in stroke care.

⁴ SEAC Report, p. 111.

⁵ SEAC report, p. 313.

⁶ Teasell RW, Foley NC, Bhogal SK, Chakraverty R, Bluvol A. A rehabilitation program for patients with severe stroke. *The Canadian Journal of Neurological Sciences* 2005; 32: 512-517. and Jankowski S, and O'Callaghan C. Stroke Rehabilitation Pilot Project Southwestern Ontario. A Regional Stroke Rehabilitation System: From Vision to Reality. *Ministry of Health and Long-Term Care*, November 26, 2004.

There is a recognized need for programs and resources for stroke survivors when they have returned to the community. Efforts are being directed at revising *Living With Stroke*, a resource devised by the Heart and Stroke Foundation of Ontario. As a facilitator-led initiative, *Living With Stroke* aims to be a locally responsive offering to support stroke survivors and their families in their home community. Its purpose is to provide an understanding of resources that exist and to help address issues of care and successful community living after stroke. The *MOST* Program (Moving On After STroke) is an example of innovative initiatives to provide support. *MOST*, a self-management program for stroke survivors and their families delivered over nine weeks, provides education and information as well as physical rehabilitation services to stroke survivors. The program model has been successfully piloted as a telehealth initiative, linking facilitators in Toronto and Thunder Bay by tele-videoconference, to support fifteen stroke survivors and their families. Positive results point to continued opportunities for expanding initiatives such as these, especially in areas where access to supports in the community may be a challenge.

Transitions

Regional case managers, community/long-term care specialists and rehab coordinator roles have been funded to assist with transitions across the continuum of care.

It has become apparent that a coordinated system for stroke relies on the patient's smooth and timely transition across the care continuum, facilitated by an appropriate flow of information for clinical management. Work is currently underway to devise standardized approaches and tools to capture the relevant stroke-related information that best informs the successive phase of care. At the same time, these tools aim to optimize efficiency and to mesh with operative data systems. TIP (Transition Information Plan) is an interdisciplinary tool to enable the transfer of information when patients transition from acute to long-term care settings. TIP comprises stroke-specific rehabilitation strategies and stroke specific functional information.

Addressing Pediatric Stroke

Early efforts at stroke system development were focused exclusively on the adult population. But infant and childhood strokes are not uncommon occurrences. Over the past ten years, childhood ischaemic stroke rates have increased to 6 per 100 000 among live births and one in every 4 000 neonates is affected by stroke.⁷ Approximately 1 childhood stroke survivor in 4 (25%) is at risk for a recurrent stroke.⁸ Like adults, childhood stroke can result in motor, cognitive and sensory impairments and reduced quality of life. Most significantly, stroke can cause an array of disabilities for a child. Long-term problems can result, particularly in neuropsychological function and behaviour that are borne for a life-time.

While a great deal of the learning about how to build an integrated system for pediatric stroke can be extracted from the adult experience, there are many ways in which the case for pediatric stroke must be uniquely considered. Issues related to stroke risk, underlying causes and prevention are beginning to be understood, but more research is required in order that comprehensive and consistent best practices for treatment can be standardized. Caring for childhood stroke is different from caring for adults; so too are the educational needs of those providing care. A more complete understanding of service needs, gaps and

7 deVeber G. In pursuit of evidence-based treatments for pediatric stroke. The UK and Chest Guidelines. *Lancet Neurol* 2005; 4: 432-36.

8 Lanthier S, Kirkham FJ, Mitchell LG, Laxer RM, Atenafu E, Male C, Prengler M, Domi T, Chan AK, Liesner R, deVeber G. Increased anticardiolipin antibody IgG titres do not predict recurrent stroke or TIA in children. *Neurology* 2004 Jan 27; 62(2):194-200.

priorities for childhood stroke survivors and their families is essential. And opportunities for collaboration with the current Ontario Stroke System regions, to build on successes and bridge gaps, will be important.

In February 2006, representatives from the five Ontario pediatric hospitals/centres⁹ and their respective OSS Regional Program Managers met to develop an initial action plan for an organized approach to pediatric stroke, within the OSS. A current provincial needs assessment will inform continued work including the development of tools and protocols for pediatric hospitals to take leadership for pediatric stroke. The action plan acknowledges that the starting point is addressing acute care in pediatric stroke, in parallel with the OSS experience of system building for adult stroke. Other immediate priorities are concerted action to link pediatrics with OSS Regional Steering Committees and regional strategic plans and to explore other formal linkages of pediatrics with regional pediatric networks.

The continued development of a system that responds to childhood stroke requires leadership and champions who will carry this important work forward. The opportunity exists to explore with LHINs how best to advance this system building with the needs of the pediatric population in the foreground. A resounding finding from the experience of the OSS is that dedicated infrastructure is vitally important to the success and sustainability of the stroke system. Undoubtedly, a model for forwarding organized pediatric stroke care would benefit from designated resources and supports. To this point in time, the Hospital for Sick Children (HSC) in Toronto has played a leadership role and it would be reasonable to see a dedicated resource centred at HSC as the hub for provincial activity. The continuing task will be to implement a system-wide plan to develop approaches for pediatric stroke care across the continuum, drawing on the successes of today's Ontario Stroke System.

Sustainable Successes of the OSS

The OSS has enabled improvements in both patient outcomes and processes of care across the continuum and notable successes are apparent. A review of accomplishments identifies key themes, representing the essential underpinnings of the Ontario Stroke System.

Collaborations and Structures that Support the OSS

One of the elements of success has been the forging of sustainable relationships across the continuum for the coordination of stroke care. The engagement of stakeholders who are committed to building an integrated system for stroke is one of the resounding accomplishments of the OSS. Infrastructure has been developed and continues to grow at both the provincial and regional levels for the purposes of planning, governing, guiding and implementing the OSS. Appendix A illustrates the provincial infrastructure currently in place.

Linkages with specialized organizations and programs have been created to advance specific initiatives across the care continuum. Notably, connections have been established with provincial professional and care-specific organizations including the Ontario Association of Community Care Access Centres (OACCAC), Ontario Association of Non-Profit Homes and Services for Seniors (OANHSS), Ontario Community Support Association (OCSA), Ontario Long Term Care Association (OLTCA), Ontario

⁹ Children's Hospital of Eastern Ontario, Kingston General Hospital, Hospital for Sick Children, McMaster Children's Hospital, Children's Hospital of Western Ontario

College of Family Physicians (OCFP), Registered Nurses Association of Ontario (RNAO) and The Aphasia Institute, among others.

Best Practices

There are notable underpinnings of the OSS that are key to its continuing success. At the core are best practice approaches for stroke which are built on research expertise and the best available evidence. The Stroke Best Practice Guidelines that have been developed through the OSS are the platform for knowledge transfer initiatives. They enable the standardization of learning content so that its application will lead to uniform changes in stroke practice across the province. There is need to ensure that care continues to be standardized and that efficiencies are achieved through approaches that foster the sharing of current information, tools and approaches across the continuum.

The creation and support of the Ontario Stroke Nursing Network (OSNN) has also been an important component of best practice stroke care. The purpose of the OSNN is to provide a forum where nurses in Ontario who are fostering leadership in stroke care can collaborate on priority issues. Topics on which they might focus could include but not be limited to the development and implementation of best practice guidelines in the areas of adult and childhood stroke, education and research.

Professional Education

One of the core elements of the OSS is professional education, which ensures education and training opportunities, with participation at all levels. Many successes have been achieved through focused efforts at both the provincial and regional levels to ensure dissemination of standardized best practices for stroke, across the continuum. Regional Education Coordinators are in place across Ontario to identify needs and develop appropriate region-specific plans that foster the dissemination and uptake of stroke best practices. Best practice dissemination is facilitated by the Ontario Regional Education Group (OREG) which brings together Regional Education Coordinators to plan and devise common approaches and to share successful strategies. Efforts are underway to exploit e-learning opportunities which present even greater potential to realize standardized best practice stroke care.

The development and distribution of resources that support stroke best practices are important accomplishments. Successes include a nursing-focused best practice guideline on stroke assessment that was developed in partnership with the Registered Nurses Association of Ontario; resources for the management of dysphagia in acute stroke; and an online education course for stroke rehabilitation assistants developed in collaboration with Humber College.

Research

Of the \$30 million allocated for the OSS, \$1.4 million is allocated to research. These funds serve to stimulate innovative thinking related to stroke and to generate new knowledge about stroke and its management. Research enables the testing of ideas and the development of new approaches that can lead to improved results for stroke patients and increased efficiency in the way professionals and providers deliver stroke services. Research supported by the OSS has seeded a number of successful initiatives in both the organization and delivery of stroke care and these are now being disseminated across the province. One such example is the dysphagia screening and support management model which enables standardized training of health providers to screen patients and streamline for full assessment only those

with the highest dysphagia risk. This successful initiative not only enables efficient screening for dysphagia, but also allows targeted use of the available but limited specialized Speech Language Pathology resources. It is of particular value given that many hospitals do not benefit from the specialized skills of speech language pathologists who are required to administer a full dysphagia assessment. This project has, in turn, seen spin-off benefits including the implementation of dysphagia guidelines within stroke clinical pathways as well as the pursuit of further research and projects in the area.

Evaluation

The ongoing management of the OSS relies on an accountability framework. A continuing commitment to evaluation of the OSS ensures accountability and enables ongoing monitoring. Regular data collection and reporting enable the development of performance benchmarks and continuous improvement of the stroke system. The Canadian Stroke Network plays an important role, generating evaluation data about Regional Stroke Centre performance through its Registry. Another initiative of the Registry of the Canadian Stroke Network, the Ontario Stroke Audit, measures stroke care delivery in a random sample of patients from all acute care hospitals in Ontario, thus enabling regions to better understand the performance of its partners. An OSS Performance Measurement Plan is being devised which will enable the dimensions of access, integration, outcomes, education and innovation/research to be measured across the continuum of care. Efforts are being directed at deriving a comprehensive set of indicators for measuring stroke system performance.

There is a continuing need to devise data systems that are timely and user-friendly and that also facilitate clinical management of stroke, using a common 'language' across the continuum of care. Further, there is need to ensure that clinical data can be used to monitor the system and to evaluate the stroke system across the care continuum and across the province.

Conclusions

At the present time, the OSS spans 9 Regional Stroke Centres, 18 District Stroke Centres and 24 Stroke Prevention Clinics. This infrastructure has enabled a number of significant successes in stroke care coordination. Ontario is a leading jurisdiction in its organized provision of emergency thrombolytic therapy and its creation of Secondary Prevention Clinics. Stroke system collaboration is facilitated at a provincial level through the OSS Provincial Steering Committee and its Subcommittees. As the system continues to develop across Ontario, there is an ongoing need to identify new opportunities and to assess the adequacy of supports to sustain a continuously evolving system.

There is need to ensure equitable access to care across the continuum for all regions in the province. Strong capacity at a provincial level is required to ensure telestroke, for example, continues to be a resource. As well, there may be need for designation of further District Stroke Centres. At this time, the gap in the Durham region is the most urgent. Of equal concern is the need for an appropriate array of rehabilitation services across the continuum and in varied settings. Secondary prevention is also a priority and ensuring standardized approaches for all Secondary Prevention Clinics across the province is important.

As the LHINs evolve across the province, the OSS can be instructive regarding integrated care successes. LHINs will be valuable partners, informing OSS planning and future implementation. It will be important

to ensure LHIN participation at regional OSS tables, so that there are collectively derived solutions for ensuring the sustainability of OSS efforts as they continue to evolve across regions of the province. These relationships are particularly important in light of the fact that new LHIN boundaries are different from the regional boundaries that exist for the OSS.

To this point in time, the OSS has focused on adult stroke. Pediatric stroke and system building to respond to the special needs of childhood stroke has come to the fore. Concerted efforts and infrastructure are required to build a system that can adequately respond to this subset of Ontario's population.

The progress that has been achieved since 2000 when the Joint Stroke Strategy Working Group tabled its blueprint report, *Towards an Integrated Stroke Strategy*, is very encouraging. Clearly, the excellent work in many communities to engage health practitioners to apply best practice stroke care is making a difference. The provincial-level efforts to enable collaboration across regions have been crucial. To maintain this momentum and take advantage of new opportunities, it will be important for the OSS to capitalize on linkages and partnerships at the provincial and regional levels, thus ensuring that stroke system building carries forward. To maximize the impact of the investment to date, the MOHLTC needs to be an active partner at a provincial level. It needs to provide continued leadership and stewardship to ensure equitable access to the best possible stroke care and, together with the Ministry of Health Promotion, realize the full potential of the OSS in preventing the occurrence of stroke among all who live in Ontario.

Appendix A

OSS Organizational Structure

