# Ontario Health Stroke Service Guideline

## District Stroke Centre

April 2025

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# Background

In June 2000, the Ministry of Health and Long-Term Care (MOHLTC) announced the Ontario Stroke Strategy, an integrated and comprehensive strategy to improve access to quality care and outcomes for persons with stroke/transient ischemic attack (TIA) through the regional organization of stroke services.[1] This strategic plan established 11 cross-continuum[2] regional systems of stroke care in Ontario.

The value of regionally organized stroke systems of care has been demonstrated in the literature.[3,4,5] Benefits include improved access to prevention, and life-saving and disability-reducing interventions, resulting in improved outcomes for persons with stroke/TIA and cost savings to the health care system.

## Regional Stroke Systems in Ontario

Each regional stroke system is comprised of a network of health service providers that collaboratively identify, prioritize, and implement initiatives to promote timely access to specialized stroke care. These networks include:

- A Regional Stroke Centre or Enhanced District Stroke Centre, with clinical and regional system accountabilities,
- District Stroke Centres where geographically required,
- Community hospitals (including Stroke Unit Hospitals, Telestroke Hospitals, and non-stroke treatment hospitals),
- Stroke Prevention Clinic(s) (SPC),
- Rehabilitation providers (inpatient stroke rehabilitation and community stroke rehabilitation),
- Community-based providers (including pre-hospital care providers, home care, primary care providers, community support agencies, health promotion practitioners, and providers associated with long-term care facilities), and
- A governance structure to ensure that the appropriate accountability and enablers are in place to support system improvement, drive evidence-informed practice, and improve outcomes for persons with stroke/TIA (refer to Appendix A: Ontario Health-Regional Stroke System Model for additional information).

[1] Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario. 2000. *Towards an Integrated Stroke Strategy for Ontario*. Report of the Joint Stroke Strategy Working Group.
[2] The continuum of care includes primary prevention, secondary stroke prevention, pre-hospital, hyperacute, acute, rehabilitation and community including re-engagement.
[3] Kapral MK, Fang J, Silver FL, Hall R, Stamplecoski M, O'Callaghan C, Tu JV. Effect of a provincial system of stroke care delivery on stroke care and outcomes. CMAJ. 2013 Jul 9;185(10):E483-91. doi: 10.1503/cmaj.121418. Epub 2013 May 27. PMID: 23713072; PMCID: PMC3708028.
[4] Manns, B.J, Wasylak, T. Clinical Networks: Enablers of Health System Change CMAJ 2019 November 25;191:E1299-1305. doi: 10.1503/cmaj.190313
[5] Fargen, K, Jauch, E, et al. Regionalization of Stroke Systems of Care Along the Trauma Model. Stroke Vol46, Issue 6. June 2015 p1719-1726 https://www.ahajournals.org/doi/10.1161/STROKEAHA.114.008167

Typically, within the regional stroke systems, a Regional Stroke Centre provides the most comprehensive array of specialized clinical services (i.e., thrombolysis, endovascular thrombectomy, neurosurgery, stroke unit care, secondary stroke prevention, and access to stroke rehabilitation), and supports a regional stroke network team in providing leadership for the development, coordination, and integration of the regional stroke system.

In certain areas of the province, where a regional stroke system covers a large geography, it may be subdivided into smaller stroke districts to support the collaborative identification, prioritization, and implementation of opportunities aimed at promoting timely access to specialized stroke care in support of the broader regional stroke system. The leadership for these districts is provided through District Stroke Centres.

In certain circumstances, a District Stroke Centre may fulfill an enhanced role within the regional stroke system. This enhanced designation may reflect the additional availability of specialized neurosurgical and neurointerventional services on site in addition to the minimum clinical requirements of a District Stroke Centre,[6] without the full stroke system and network responsibilities of a Regional Stroke Centre (i.e., Enhanced District Stroke Centre- Clinical). Alternatively, an Enhanced District Stroke Centre (EDSC) designation may reflect situations where the hospital has additional regional stroke system and network leadership responsibilities like a Regional Stroke Centre, without meeting all clinical requirements for the designation of a Regional Stroke Centre (i.e., Enhanced District Stroke Centre- System). The EDSC- System supports a regional stroke network team in providing leadership for the development, coordination, and integration of the regional stroke system. In both circumstances, the EDSC functions similarly to a Regional Stroke Centre for the respective enhancement (i.e., clinical or system and network).

All Regional Stroke Centres have a Stroke Prevention Clinic that provides the most comprehensive array of stroke prevention services, acting as a regional resource for other stroke prevention services. The clinic, in collaboration with the regional stroke network team provides leadership for advancing stroke prevention services throughout the region.[7]

In larger geographies, District Stroke Prevention Clinic(s), including Enhanced District Stroke Prevention Clinics, may also be established to provide stroke prevention services and augment stroke prevention leadership to a sub-geography within the region. Community Stroke Prevention Clinics may also be established to deliver stroke prevention services closer to home.[7]

The Regional, Enhanced and District Stroke hospitals and prevention clinics received funding to support their enhanced role in the regional stroke system, including stroke network leadership and/or clinical responsibilities. The accountabilities and responsibilities associated with these resources were outlined in Stroke Service Guidelines established by the MOHLTC as part of the implementation of the Ontario Stroke Strategy.

[6] Refer to the Ontario Specialized Acute Stroke Services Framework for additional detail regarding the classification system for specialized acute stroke services in Ontario.

[7] For additional detail regarding the accountabilities and responsibilities of Regional, Enhanced District, District and Community Stroke Prevention Clinics, review the Ontario Health Stroke Service Guideline- Regional, Enhanced District, District and Community Stroke Prevention Clinic

# About this Document

Preserving Ontario's regional stroke systems and networks is a provincial priority to ensure continued advancements in access to quality stroke care across all care sectors and optimization of stroke system performance for persons with stroke/TIA and providers.

The District Stroke Centre plays an integral role in the regional stroke system and network. This document provides an update to the Ministry of Health and Long-Term Care's original Stroke Service Guidelines (2004/05) for District Stroke Centres, incorporating Ontario Health's expectations of these hospitals in the current health care system. The service guidelines are divided into two sections to reflect the District Stroke Centre's accountabilities and responsibilities with respect to the:

- District Stroke System and Regional Stroke Network (Section A)
- Provision of specialized stroke services (Section B)

# Section A- District Stroke System and Regional Stroke Network

## Accountabilities

- Establish and maintain a district stroke team (refer to Appendix B for key system and network leadership roles and associated responsibilities), on behalf of the stroke district and regional stroke network;[8]
- Work in the best interest of the district stroke system, regional and district stroke partners, and the Ontario Health Region(s) to ensure a high-performing and sustainable cross-continuum district stroke system that is population based (e.g., care closer to home), person-centred, grounded in evidence-informed best practice and experiences of persons with stroke/TIA, and aligned to the broader regional stroke system;
- Provide leadership to the planning, development, implementation, coordination, integration, and evaluation of a cross-continuum district stroke system, through the support of the District Administrative Lead, and in partnership with the Regional Stroke Centre/Enhanced District Stroke Centre-System, Ontario Health Region(s), Regional Stroke Network Committee[9] and District Engagement Table(s);
- Optimize the outcomes of individuals at risk of or who have had a stroke that are receiving care within the stroke district.

[8] Hospitals are encouraged to continue to use separate cost centres as established with the original funding

[9] Most Regional Stroke Networks have operationalized this committee as a "Regional Stroke Network Steering Committee; however, some networks may choose to adopt a different title for the committee to distinguish its purpose from the Ontario Health Region Stroke Executive Table. Regardless of title, the purpose and functions of the committee should remain consistent across the province (refer to Appendix A: Regional Stroke System Model for additional detail)

## Responsibilities

- Enable the district stroke team to successfully fulfill their respective responsibilities (e.g. education and travel resources) as outlined in Appendix B- Section A (i.e., Key System and District Leadership Roles and Associated Responsibilities);
- Develop and implement a stroke district work plan that aligns to the regional stroke network strategy and workplan and supports progress towards provincial performance targets established by Ontario Health;
- Work in partnership with the regional stroke network team and other health service providers to support system planning, coordination, and access to specialized stroke services across the continuum (e.g., medical redirect/bypass and repatriation agreements, capacity building, triage processes, referral and management processes for rehabilitation and secondary stroke prevention,[10] etc.);
- Assist with planning, development and implementation of standardized processes and protocols at partner sites (e.g., acute care, rehabilitation, community, etc.) within the stroke district and as appropriate through close collaboration with adjacent stroke districts, Ontario Health Teams or other appropriate partners, to support an integrated system of care and timely access to best practice stroke care across the continuum (including contingency plans at partner sites to mitigate specialized stroke service disruptions);
- Ensure mechanisms are in place across the stroke district to collect core stroke system data, as defined by Ontario Health and the Regional Stoke Network Committee, and monitor cross-continuum stroke system performance and quality improvement efforts, working collaboratively with the Regional Stroke Centre/Enhanced District Stroke Centre-System, Regional Stroke Network team, and Ontario Health to address performance gaps;
- As appropriate, establish and administer stroke District Engagement Table(s) comprised of cross-continuum health service providers, stroke system leaders, and persons with lived experience to engage in and support district stroke system accountabilities (refer to Appendix A, Table 1: Regional Stroke System Committees for additional detail regarding the purpose of the District Engagement Table(s));
- Ensure representation of senior District Stroke Centre leadership (e.g., Vice President) at the Regional Stroke Network Committee, and as required, at the Ontario Health Region Stroke Executive Table (refer to Appendix A, Table 1: Regional Stroke System Committees for additional detail regarding the purpose of the Regional Stroke Network Committee and Ontario Health Regional Stroke Executive Table);
- Support regular updates and discussions at the Regional Stroke Network Committee[9] relative to the development and implementation progress of the stroke district workplan.

[10] For additional detail regarding the accountabilities and responsibilities of Regional, Enhanced District, District and Community Stroke Prevention Clinics Ontario Health Stroke Service Guidelines- Regional, Enhanced District, District and Community Stroke Prevention Clinic

# Section B-Provision of Specialized Stroke Services

District Stroke Centres are classified as Level 3 service providers within the Ontario stroke system,[11] providing all acute stroke services except for neurosurgical and neurointerventional procedures (i.e., thrombolysis, stroke unit care, secondary stroke prevention,[12] and access to inpatient/community stroke rehabilitation and community reengagement support services[13]).

## Accountabilities

- Establish and maintain district clinical resources per original funding (refer to Appendix B- Section B for key clinical roles and associated responsibilities);
- Provide 24/7 thrombolysis and acute stroke services, in alignment with evolving best practices;
- Serve as an expert clinical resource, offering guidance and support to health service providers across the stroke district;
- Ensure appropriate pathways are established to support timely access to endovascular thrombectomy, neurosurgical services, and post-stroke services, particularly access to acute stroke unit care, specialized stroke rehabilitation, secondary stroke prevention, and community reintegration/resources;
- Optimize the outcomes of individuals at risk for stroke or who have had a stroke receiving care at the District Stroke Centre.

## Responsibilities

- Establish and maintain an on-call schedule of staff stroke specialists with fellowship training or equivalent experience and support staff (e.g., CT technologists) to support hyperacute[14] consultation 24/7 (e.g., thrombolysis). Radiologists should also be available 24/7 to review images post hyperacute consultation;
- Establish and maintain Emergency Department and in-hospital code stroke protocols, policies, processes, and staff to support code stroke response, including 24/7 access to on-site CT/CT angiography (CTA). CT perfusion (CTP) with Health Canada Approved automated post processing software (e.g. RAPID AI) is also strongly recommended;
- Ensure timely access to appropriate levels of care required to support hyperacute stroke services (e.g., Level 2 Basic on-site, with the ability to escalate to Level 3 Basic, as defined by Critical Care

[11] Refer to The Ontario Health-CorHealth Specialized Acute Stroke Services Framework (SASSF) for additional details regarding the classification system for specialized acute stroke services in Ontario.
[12] For additional detail regarding the accountabilities and responsibilities of Regional, Enhanced District, District, and Community Stroke Prevention Clinics Ontario Health Stroke Service Guidelines- Regional, Enhanced District, District and Community Stroke Prevention Clinic
[13] Rehabilitation is only provided at select hospitals with inpatient rehabilitation beds and/or community stroke rehabilitation. District Stroke Centres are required to have established pathways to support access to stroke rehabilitation services and community reengagement supports.
[14] Where this expertise is not available on site, DSCs may leverage local Telestroke models or the Ontario Telestroke Program.

Services Ontario, ideally on, or with adjacencies to, the stroke unit);

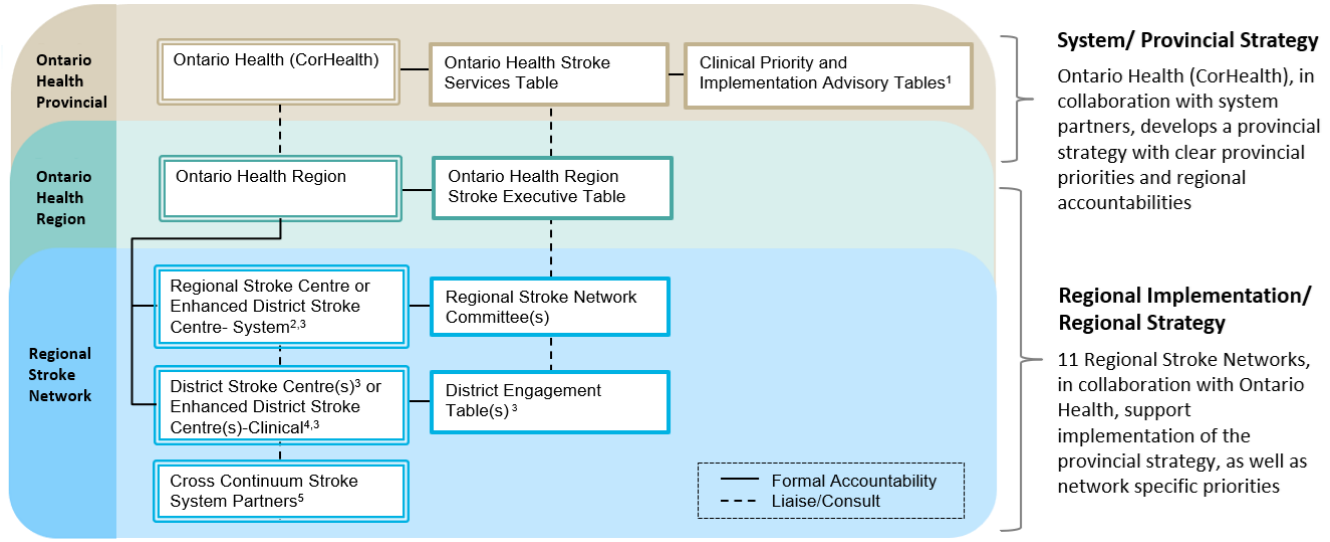
- Establish pathways to enable timely access to endovascular thrombectomy and neurosurgical services available at Level 4 acute stroke specialized service providers (e.g., Regional Stroke Centres);
- Establish a stroke unit that adheres to the provincial *Stroke Unit Definition and Best Practice Standard*,[15] ensuring appropriate persons with stroke/TIA are prioritized[16] in a timely manner to access specialized interprofessional stroke care;
- Ensure physicians supporting the stroke unit, whether on service or on call, have experience in stroke care. Additionally, establish pathways through the Regional Stroke Centre or Enhanced District Stroke Centre- System for rapid access (24/7), as needed, to stroke specialists with fellowship training or equivalent.
- Provide acute and secondary stroke prevention consultation and mentoring to other hospitals in the stroke district to promote access to best practice treatment/interventions;[17]
- Implement protocols, established in partnership with district stroke system partners, that promote access to services at the District Stroke Centre and post-stroke care close to home (e.g., medical redirect/bypass and repatriation agreements, etc.);
- Establish protocols and pathways, with case management/care coordination support, to ensure person-centred transitions to the appropriate next level of care (e.g., rehabilitation, secondary stroke prevention, primary care, home care, community support services, etc.);
- Establish contingency plans to ensure access to specialized stroke services in the event of an interruption in the delivery of any specialized stroke services, including health human resource availability and/or equipment downtime;
- Establish mechanisms locally to monitor clinical performance relative to established regional and provincial targets and protocols, working to address gaps as part of ongoing continuous quality improvement;
- Work in close collaboration with the Regional Stroke Centre and/or Enhanced District Stroke Centre- System, and across regional stroke systems, to ensure cross-regional integration and a province-wide system of care that is person-centred and based on best practice (i.e., supporting persons with stroke/TIA to receive the right care, at the right place, at the right time).

[15] Ontario Stroke Unit Definition-A best practice standard for stroke units in Ontario

[16] In circumstances where stroke unit care is determined to be the most appropriate level of care for the individual with stroke/TIA, the stroke unit's responsibilities may extend beyond the hospital's typical catchment area when it is the closest stroke unit to the person's home.

[17] For additional detail regarding the accountabilities and responsibilities of Regional, Enhanced District, District and Community Stroke Prevention Clinics Ontario Health Stroke Service Guidelines- Regional, Enhanced District, District and Community Stroke Prevention Clinic

# Appendix A: Ontario Health-Regional Stroke System Model




1. Varies depending on provincial priorities, and also includes the stroke system Regional and District Advisory Committee to inform and enable implementation
2. Enhanced District Stroke Centres with regional stroke system accountabilities
3. Where applicable
4. Enhanced District Stroke Centres with neurosurgical and neurointerventional services on site in addition to the minimum clinical requirements of a District Stroke Centre
5. Community Hospitals (Stroke Unit Hospitals, Telestroke Hospitals, and non-stroke treatment hospitals), Stroke Prevention Clinics (including designated Regional, Enhanced District, District and Community SPCs), rehabilitation providers, community-based providers, emergency health services providers (paramedics, ORNGE)

**TABLE 1: REGIONAL STROKE SYSTEM COMMITTEES**

| Structure | Purpose |
|---|---|
| Ontario Health Stroke Services Table | • To bring together key clinical, system planning and implementation leaders from across the province to engage in strategic dialogue and provide advice at a provincial level on stroke system priorities, issues and opportunities that will transform the system, drive access and quality, improve performance and outcomes for persons with stroke/TIA. |

| | |
|---|---|
| Ontario Health Region Stroke Executive Table | • To strengthen the relationship between the Regional Stroke Networks and Ontario Health Region by bringing together senior leadership from each to engage in strategic dialogue around the implementation of provincial and regional stroke care priorities, ensuring designated hospitals are fulfilling stroke system accountabilities and enabling the networks to drive access to quality stroke care across the continuum. |
| Regional Stroke Network Committee[18] | • A forum to bring cross continuum network partners together to collaborate and provide advice, and local commitment to implementation of cross continuum best practice, system planning, coordination, and improvement initiatives to advance provincial/regional priorities, drive quality performance and outcomes for persons with stroke/TIA. |
| District Engagement Table(s) | • A forum to bring cross continuum district partners together to collaborate and provide advice, and local commitment to implementation of cross continuum best practice, system planning, coordination, and improvement initiatives to advance provincial/regional priorities, drive quality performance and outcomes for persons with stroke/TIA. |

[18] Most Regional Stroke Networks have operationalized this committee as a "Regional Stroke Network Steering Committee; however, some networks may choose to adopt a different title for the committee to distinguish its purpose from the Ontario Health Region Stroke Executive Table. Regardless of title, the purpose and functions of the committee should remain consistent across the province (refer to Appendix A: Regional Stroke System Model for additional detail)

# Appendix B: Key Roles within the District Stroke Centre

## Section A- Key System and District Leadership Roles and Associated Responsibilities

### District Medical Champion (e.g., Stroke Physician Lead)

- Collaborate with the Regional Stroke Network Medical Lead (e.g., Stroke Regional Medical Director) and Stroke District Administrative Lead (e.g., District Stroke Coordinator) to champion the implementation of clinical excellence for all aspects of stroke care within the stroke district and across the care continuum.

### Stroke District Administrative Lead (e.g., District Stroke Coordinator, Stroke District Manager)[19]

- Lead the planning, development, and implementation of a district stroke system workplan that reflects district stroke system needs, is based on best practice evidence, and is aligned to the associated regional stroke network workplan;
- Support and manage implementation of best practice, in collaboration with health system providers, within the district and across the continuum of care[20] (e.g., policies, clinical protocols, and processes to coordinate timely access to specialty consults, diagnostics, surgery, clinics and prevention programs; ambulance dispatch communication policies; hospital bypass protocols and community hospital triage and transport process; follow-up care and preventative interventions; stroke rehabilitation services and community reintegration supports);
- Represent the interests and needs of the district stroke system at local, regional, and provincial tables (e.g., Regional Stroke Network Committee, Regional and District Advisory Committee, Ontario Health Team committees/groups);
- Develop and foster effective working relationships with district stroke system partners, including persons with lived experience, to enable the advancement of district stroke system priorities;

[19] Per original funding. Roles may have been expanded or adapted to meet district accountabilities. Hospitals may have their own organizational policies and processes regarding job classifications, titles, and reporting structures.
[20] The continuum of care includes primary prevention, secondary stroke prevention, pre-hospital, hyperacute, acute, rehabilitation and community including re-engagement.

- Review and leverage quantitative and qualitative data to monitor progress in district performance, develop quality improvement initiatives, and influence district stroke system improvements;
- Act as an advisor for the stroke system within the stroke district and across the continuum, serving as the go-to contact for stroke-related initiatives (e.g., responding to questions relating to stroke best practice, coordinating responses from subject matter experts);
- Work closely with the regional stroke network team to ensure alignment and integration of the district stroke system to the broader regional system.

# Section B- Key Clinical Roles and Associated Responsibilities[21]

## On-Call Physician with Stroke Care Experience[22]

The expectations for on-call physicians include but are not limited to:

- 24/7 on-call coverage for hyperacute and acute stroke consultation;
- 15-minute arrival/contact to the patient from time of call for code stroke response;
- Provision of clinical leadership and mentoring of other physician staff within the DSC;
- Consultation (e.g., telephone, Telestroke) support to other physicians within the DSC and hospitals within the district.

## Stroke Nurse Specialist (e.g., Clinical Nurse Specialist)

- Services provided by the Stroke Nurse Specialist(s) are determined by the specific DSC needs (e.g., thrombolysis administration, code stroke lead);

[21] Per original funding. Roles may have been expanded or adapted to meet district accountabilities. Hospitals may have their own organizational policies and processes regarding job classifications, titles, and reporting structures.
[22] These physicians should have access to stroke specialists with fellowship training or equivalent to support hyperacute consultation (e.g., local telestroke models or the Ontario Telestroke Program) and acute stroke care (consultation support provided by the Regional Stroke Centre or Enhanced District Stroke Centre- System), as required.

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