



**Ontario
Health**



Improving Access to Carotid Artery Intervention for Symptomatic Extracranial Carotid Disease in Ontario:

Wait Time Information System Priority Level Definition Updates and Recommendations for Hospitals and Providers

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About Ontario Health-CorHealth Ontario

On December 1, 2021, CorHealth Ontario (CorHealth) transferred into Ontario Health. Ontario Health - CorHealth's mandate spans cardiac, stroke, and vascular throughout the entire course of care, including secondary prevention, rehabilitation, and recovery. Ontario Health – CorHealth advises the Ministry of Health, Ontario Health Regions, hospitals, and care providers to enhance the quality, efficiency, accessibility, and equity of cardiac, stroke, and vascular services for patients across the province.

Purpose

To support hospitals and providers that perform carotid revascularization to provide access to carotid intervention within best-practice wait-times, this document focuses on the urgent symptomatic patient with a mild to moderately disabling stroke or transient ischemic attack (TIA), that have significant extracranial carotid stenosis and are likely to benefit from carotid artery intervention. This document excludes hyperacute or emergent stroke syndromes, or crescendo TIA.

The purpose of this document is to:

1. Provide updated Wait Time Information System (WTIS) priority level definitions for carotid endarterectomy. These updated definitions will be reflected in an update to the WTIS Priority Assessment Tool the fall 2023.
2. Provide recommendations of strategies that should be considered for implementation by hospitals and providers if CEA wait time targets are consistently not achieved.

Background

Carotid endarterectomy (CEA) and carotid artery stenting (CAS) remain two essential methods of internal carotid artery (ICA) revascularization following an ischemic stroke or TIA. Access to timely revascularization following these symptomatic events is crucial, as revascularization helps to prevent recurrent embolic events and disabling strokes. The number needed to treat (NNT) to prevent a stroke or TIA within 5-years for moderate to severe symptomatic ICA stenosis with CEA is approximately 5 for men and 36 for women, arguably better than many interventions used for other acute diagnoses if performed in a timely manner.¹

Time to intervention is critical, as the highest risk of event recurrence is within the first days following the index event. Previous studies have demonstrated recurrent rates of neurological events as high as almost 20% within seven days of an ischemic stroke or TIA.² Therefore, timely access to carotid intervention remains the best outcome predictor to mitigate the devastating effects of a subsequent stroke or TIA following a symptomatic event.

The *Canadian Stroke Best Practice Guidelines* recommend that patients with a mild to moderately disabling ischemic stroke or TIA undergo evaluation for carotid intervention without delay if they have moderate to severe stenosis of the extracranial ICA (50%–99%). For most of these patients, revascularization should occur, ideally within the *first few days* of presentation if possible, and no later than 14 days.³ While a small subset of patients may benefit from purposeful delay to 14-days or, rarely, outside of this time window (e.g., in a person with a more severely disabling stroke to allow some recovery and determine if revascularization would be clinically beneficial), this decision should be directed by a

stroke care specialist only after carefully balancing risks of treatment delay. The literature clearly demonstrates a positive relationship between early time-to-carotid intervention and favorable outcomes for most patients following the index stroke or TIA event. Therefore, these symptomatic patients should be considered as having a medically urgent diagnosis that requires timely access to care.

Current State of Carotid Revascularization Timeliness in Ontario

Data shared by Ontario Health Surgical Information Program (formerly Access to Care), indicates that the wait time for patient triaged as urgent (Priority 2) carotid endarterectomy in Ontario has consistently surpassed the 14-day upper threshold over the last five years (Figure 1). There has been a year-over-year downward trend in timely access for this patient population. Although COVID-19 Pandemic related stressors may account for some of this trend, these trends occurred prior to the pandemic. Efforts to adhere to the Canadian Stroke Best Practice Guideline recommendation for timely access to carotid revascularization must be prioritized.

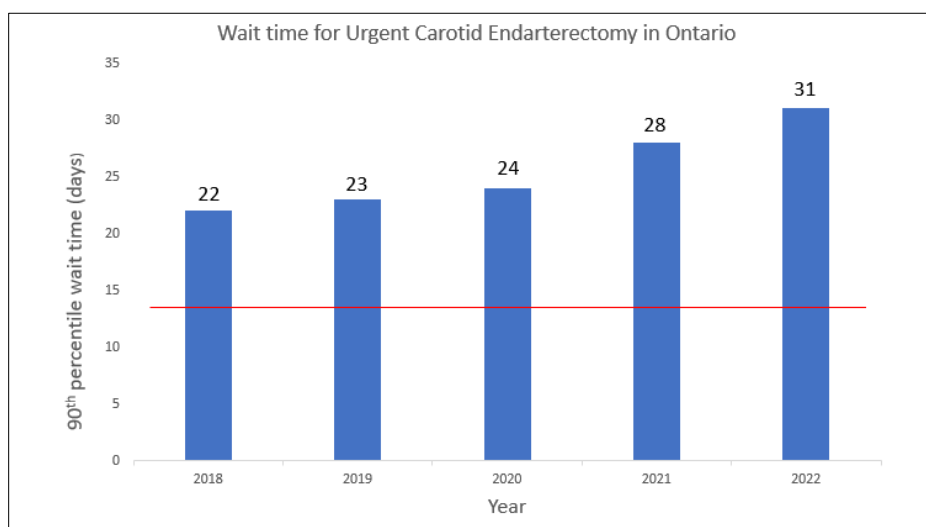


Figure 1. 90th percentile 5-year wait times for urgent (defined as <2 weeks, Priority 2 cases) for carotid endarterectomy in Ontario. The red line is the 14-day upper threshold for appropriate procedure time for symptomatic patients. (Source: Ontario Health Wait Time Information System. Accessed 04 April 2023.)

Wait Time Information System (WTIS)

The Ontario Health Surgical Information Program operates and maintains the provincial Wait Time Information System (WTIS) to collect accurate and timely surgery, diagnostic imaging and alternative level of care wait time data as a key component of Ontario’s Wait Time Strategy. The WTIS surgery priority level definitions are used to assign a priority designation for the purpose of the timing of scheduling an operative procedure and should only be used **after** a clinical decision to treat has been made. The information collected is used to report on patient access to services. The WTIS supports the management of surgical waitlists by tracking patients waiting for a specific procedure based on their defined priority level. Information collected in the WTIS is designed to be used by clinicians and administrators to inform decision making and planning to improve access to care. At the same time, it informs performance management and improvement in hospitals across the province.

Ontario Health recognized the need to update the WTIS priority level definitions for carotid endarterectomy, as they did not reflect current literature, including the Canadian Stroke Best Practice Guidelines. The revisions provide an opportunity to clarify these definitions clinically, thereby helping to designate patients to the most appropriate priority level. Updated definitions will be effective as of fall 2023 and are outlined in Figure 2 of this document.

Improving Access to Care: WTIS Carotid Endarterectomy Surgery Priority Definitions

Access to carotid revascularization after a symptomatic event is an important predictor for patient outcome after a mild to moderately disabling ischemic stroke or TIA from a significant carotid stenosis. Clinically, there has been a paradigm shift away from using only the degree of stenosis as the basis for timing access to revascularization.⁴ Given that the event is an embolic phenomenon, rather than hemodynamic, other factors are considered in the decision to treat. These include plaque composition (e.g., ulceration, soft plaque), evidence of disease progression, plaque rupture, amongst others. These diagnostic adjuncts are important considerations in decision making.

Figure 2 provides updated and previous WTIS priority level definitions for carotid endarterectomy. These priority level definitions are intended for use by clinical experts that perform vascular/interventional procedures for carotid stenosis, in collaboration with experts in stroke care. The previous priority level definition for carotid revascularization recommended urgent revascularization (Priority 2 < 2 weeks) for patients with symptomatic ICA disease, specifically targeting only those patients with severe (70-99%) stenosis. However, this previous definition did not align with the literature and current best practice recommendations for symptomatic carotid artery disease. Additionally, the updated priority level definitions are meant to provide improved clinical clarity to support designation of patients to the most appropriate priority level. Information related to asymptomatic carotid artery disease is provided in the subsequent section of this document.

Panel A.

NEW Carotid Endarterectomy		
Wait 2 Priority Assessment Tool		
Priority	Descriptions	Access Target
1	<ul style="list-style-type: none"> Immediate – crescendo clinical neurological events 	Within 24 Hours
2	<ul style="list-style-type: none"> Symptomatic stenosis with a focal neurological event with either transient ischemic event or non-disabling stroke with moderate to severe stenosis (50-99 percent) 	Within 2 Weeks
3	<ul style="list-style-type: none"> Asymptomatic stenosis with 50-99% stenosis AND high risk features <ul style="list-style-type: none"> o ulcerated/irregular plaque, plaque hemorrhage, contralateral ICA occlusion, progressive stenosis, young patients, etc. 	Within 8 Weeks
4	<ul style="list-style-type: none"> Asymptomatic stenosis with 50-99% stenosis <i>without</i> high-risk features 	Within 26 Weeks

Panel B.

OLD Carotid Endarterectomy		
Wait 2 Priority Assessment Tool		
Priority	Descriptions	Access Target
1	<ul style="list-style-type: none"> Immediate – crescendo clinical neurological events 	Within 24 Hours
2	<ul style="list-style-type: none"> Symptomatic stenosis, hemispheric transient ischemic events or monocular visual symptoms Severe stenosis (>70 percent) High probability that treatment delay will affect physical or cognitive ability; and/or High probability that treatment delay could affect life expectancy or function 	Within 2 Weeks
3	<ul style="list-style-type: none"> Symptomatic stenosis with hemispheric TIA or monocular visual symptoms and 50-70 percent stenosis 	Within 8 Weeks
4	<ul style="list-style-type: none"> Asymptomatic stenosis regardless of stenosis Elective indication for surgery; and/or Minimal risk of morbidity incurred by waiting 	Within 26 Weeks

Figure 2. (Panel A) **NEW REVISED** Access to Care Wait 2 Priority Assessment Tool carotid endarterectomy descriptions and (Panel B) Previous Access to Care Wait 2 Priority Assessment Tool carotid endarterectomy descriptions.

Appropriateness of Care: Patient Selection

Ontario Health WTIS data for fiscal year 2022/23 indicates that approximately 20% of all scheduled carotid endarterectomies were performed on Priority 4 patients. These patients were asymptomatic according to the Priority 4 definition. Published literature and guidelines suggest that the clinical benefit of revascularization in the asymptomatic cohort may be minimal, with medical therapy likely the best treatment for most asymptomatic patients.⁵ A small subset of asymptomatic patients may benefit from revascularization due to high-risk features, although this subset should represent only a small fraction of all asymptomatic patients.⁶

By performing fewer interventions for asymptomatic patients who are unlikely to benefit, these patients can avoid the risks inherent to any surgical or interventional procedure, while receiving appropriate preventative medical therapy. Resources can then be prioritized for symptomatic patients requiring timely revascularization.

Following implementation of the new carotid endarterectomy priority level definitions, it is anticipated that, over time, the proportion of Priority 2 patients will increase, while there will be a decrease in volume of carotid revascularizations procedures done on asymptomatic Priority 4 patients.

Recommendations

Recommendations for Hospitals and Providers

There are many examples across Ontario of innovative strategies and practice changes that can serve as excellent models to achieve timely access to urgent carotid revascularization. Understanding that some strategies may not be applicable or feasible at all hospitals providing carotid revascularization, Ontario Health, in collaboration with physician leaders, have identified the following strategies for hospitals and providers to consider. These strategies should be implemented if provincial carotid endarterectomy wait time targets are consistently unmet.

If review of current processes indicates that improvement of care integration across the care continuum will support timely access to carotid revascularization, reference to the Canadian Stroke Best Practice Guidelines is recommended.⁷ The Canadian Stroke Best Practice Guidelines provide descriptions of pathways and best care for identification and management of ischemic stroke or TIA using a team approach, including access to medical imaging, and initiation of medical therapy.

Recommendations described in this document are intended as guidance for hospitals and providers to support achievement of wait time targets for urgent symptomatic patients with a mild to moderately disabling stroke or TIA due to significant carotid stenosis and who would benefit from carotid revascularization. The strategies outlined below exclude management of hyperacute or emergent stroke syndromes, or crescendo TIA.

1. Supporting Timely Access to Carotid Intervention

Carotid revascularization in Ontario is provided by vascular surgery, neurosurgery, and interventional radiology/neuroradiology practitioners. These practitioners must ensure symptomatic patients can receive timely care within the recommended windows, as per the Canadian Stroke Best Practice Guidelines.

Hospitals should review current internal processes to ensure rapid access to services for identification and management of ischemic stroke or TIA, including access to medical imaging, and initiation of medical therapy, and to ensure that these processes include timely access to assessments and consultations that will inform decisions regarding the need for carotid revascularization. This may require collaboration within or across hospital divisions and departments, especially when considering post-pandemic reductions in operative time and other competing cases. Hospital administration should also recognize the importance of urgent revascularization and assist with mechanisms to support timely access. If barriers to carotid revascularizations are identified, strategies should be developed and implemented to improve access.

2. Periodic Review of Local-Regional Data

Hospitals should be aware of their own local-regional data with respect to patient selection, to ensure patients receiving intervention are likely to benefit based on best practice and published data, and with respect to prioritizing access to intervention for symptomatic patients. Through review of local-regional data, should hospitals become aware of opportunities to improve patient selection, prioritization and/or

timeliness to carotid revascularization, hospitals, together with their clinical teams, should develop and implement strategies that address the improvement opportunities. Hospitals and their clinical teams should develop internal methods to periodically review data to ensure continued appropriate patient selection for carotid revascularizations and positive improvements in access wait times.

System Monitoring

Together, the Ontario Health Surgical Information Program and Ontario Health-CorHealth will continue to regularly monitor carotid revascularization wait time data. It is expected that, over time, the data will demonstrate improvement in timeliness to revascularizations for patients who are likely to benefit from the procedure.

Ontario Health will establish a regular cadence of touchpoints with hospitals that provide carotid revascularization, to review hospital performance, including patient selection and timely access to carotid revascularization. These touchpoints will facilitate a process to review and discuss local carotid revascularization access issues, share best practices provincially and will provide opportunities for the system to work collaboratively towards a provincial goal of equitable access to timely care.

Impact of COVID-19

The impacts of COVID-19 to the health system in Ontario have been multi-fold. The subsequent impact on access to care and patients remains an issue that will certainly take time to return to pre-pandemic baselines. Therefore, it is understood that while recommendations for timely access to care for symptomatic carotid patients are crucial, other external factors may provide barriers in the short-term. Regions, hospital systems and practitioners must ensure, however, that timely access to acute and often life-and limb saving care be maintained. This remains imperative if improvements in the quality of care provided to these patients are to be achieved. Recognition that symptomatic ischemic stroke or TIA patients are often some of the most urgent cases within the health system will help ensure they remain a priority.

Conclusion

Ontario Health will collaborate with hospitals and practitioners to identify local/regional barriers to care for this subset of patients. The recommendations outlined serve as a guide to transform systems to provide innovative and local/regional-specific pathways to ensure appropriate access to carotid revascularization. Successful pathways could conceivably serve as models for other disease processes. Attention to issues such as access to urgent carotid revascularization became increasingly important after the COVID-19 Pandemic and the subsequent impact on health resources. Through interprofessional partnerships, local/regional health systems can create action plans to ensure these patients receive timely carotid interventions when required.

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This document was developed with input from system partners in diagnostic imaging, emergency medicine, interventional radiology, neurosurgery, stroke neurology, and vascular surgery.