Ontario Health
CorHealth Ontario

Stroke Report Technical Specifications

Released: February 2026

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Section 1: Cohorts

Hyperacute Care Episode Cohort

Data Source(s)	Discharge Abstract Database (DAD) National Ambulatory Care Reporting System (NACRS)
Cohort creation	Hyperacute Care Episode Cohort creation steps: 1) Pull qualifying ED visits with ischemic stroke diagnosis, i.e., NACRS encounters meeting the following inclusion and exclusion criteria: **Inclusion criteria**, i.e., records meeting all the following criteria: • Registration dates within reporting period • Patient is an Ontario resident with eligible health card number • Valid person identifier • Patient age >= 18 • With main problem diagnosis of I63* (except I636), I64* or H341 except those recorded by the physician as questionable • Visit functional centre (VFC) code is for an ED visit: '71310', '72310', or '73310' • Visit is unscheduled **Exclusion criteria**, i.e., exclude among records meeting inclusion criteria those with any of the following: • Sign-outs against medical advice or left before being seen. **Refer to the 'Sign-out' category in Appendix Table 2** for details. • Prior diagnosis of palliative care (ICD-10CA = Z515 in any diagnosis field and corresponding diagnosis prefix code = 8) 2) Pull qualifying acute inpatient admissions for ischemic stroke, i.e., DAD encounters meeting the following inclusion and exclusion criteria: **Inclusion criteria**, i.e., records meeting all the following criteria: • Discharge dates within reporting period • Patient is an Ontario resident with eligible health card number • Valid person identifier • Patient age >= 18 • With any diagnosis of I63* (except I636), I64* or H341 of diagnosis type M, 1, 2, W, X, Y. *Note: while other diagnosis types were considered, restricting to the above diagnosis types applies a more specific definition of ischemic stroke. Higher specificity is preferred for measurement purposes.* **Exclusion criteria**, i.e., exclude among records meeting inclusion criteria those with any of the following: • Prior diagnosis of palliative care (ICD-10CA = Z515 in any diagnosis field and corresponding diagnosis prefix code = 8)

	3) Create patient episodes comprising one or more encounters from steps 1) and 2). Encounters within one day of another are assumed to be part of the same patient episode.
Used for calculation of	The Hyperacute Care Episode Cohort is used to create the following indicators: • Thrombolysis Treatment Rate • EVT Treatment Rate • Median Door-to-Needle Time Among Ischemic Stroke Patients who Received Thrombolysis • Median Door-in/Door-out (DIDO) Time • Median Time from Door Time at the EVT Hospital to qualifying CTA, CTP, or MRA • Median Time from Door Time at the EVT Hospital to Arterial Puncture • Median Time from Door Time at the EVT Hospital to First Reperfusion • 30-Day All-Cause Mortality Rate of EVT Patients
Other notes	• Episodes are attributed to fiscal years and quarters based on the latest separation date among all encounters in the episode • Patients' age and postal code are assigned at episode level based on identifiers recorded on the first chronological encounter in the episode

Acute Inpatient Episode Cohort

Data Source(s)	DAD
Cohort creation	Acute Inpatient Episode Cohort creation steps: 1) Pull qualifying acute inpatient admissions for ischemic stroke, i.e., DAD encounters meeting the following inclusion and exclusion criteria: **Inclusion criteria**, i.e., records meeting all the following criteria: • Discharge dates within reporting period • Patient is an Ontario resident with eligible health card number • Valid person identifier • Patient age >= 18 • With most responsible diagnosis (MRDx) as one of the following: G45 (except G454), H340, H341, I61, I63, or I64. **Refer to Appendix Table 1** for details. **Exclusion criteria**, i.e., exclude among records meeting inclusion criteria those with any of the following: • In-hospital or post-admission stroke (Type 2) diagnosis of any of the following: G45 (except G454), H340, H341, I61, I63, or I64 • Elective admission • Prior diagnosis of palliative care (ICD-10CA = Z515 in any diagnosis field and corresponding diagnosis prefix code = 8) 2) Create patient episodes comprising one or more encounters from steps 1) and 2). Encounters within one day of another are assumed to be part of the same patient episode.
Used for calculation of	The Acute Inpatient Episode Cohort is used to create the following indicators: • Risk-Adjusted 90-Day All-Cause Mortality Rate of Stroke/TIA Acute Patients

Other notes	• As of February 2026, this cohort uses a definition of stroke that was updated with the following changes to more closely align with the patient population cared for by the Ontario stroke system:
	  • exclude patients with MRDx of I60: Subarachnoid haemorrhage
	  • include patients with MRDx of I636: Cerebral infarction due to cerebral venous thrombosis, non-pyogenic
	• Episodes are attributed to fiscal years and quarters based on the latest discharge date among all encounters in the episode
	• Patients' age and postal code are assigned at episode level based on identifiers recorded on the first chronological admission in the episode

Section 2: Indicator Methodologies

Hyperacute Care for Ischemic Stroke

Thrombolysis Treatment Rate

Indicator Definition	The percentage of ischemic stroke patients who received thrombolysis.
Data Source(s)	Hyperacute Care Episode Cohort
Denominator	The denominator cohort are patient episodes defined by the following steps: 1) In each reported fiscal year, identify patients with at least one stroke episode in the Hyperacute Care Episode Cohort with *any* of the following: a) A cohort-comprising ED visit (i.e., meeting all criteria in step 1 of the Hyperacute Care Episode Cohort creation steps) *and without recorded transfer to acute care* b) A cohort-comprising acute admission (i.e., meeting all criteria in step 2 of the Hyperacute Care Episode Cohort creation steps) *and all the following criteria*: • without type 2 ischemic stroke diagnosis • without elective admission c) A cohort-comprising ED visit *with recorded transfer to acute care* and subsequent cohort-comprising acute admission within 1 day *Note: this combination of encounters includes patients with both of the following:* *i. a community onset stroke presenting in the ED* *ii. subsequent admission with in-hospital stroke (assumed to be a second stroke distinct from the community onset stroke) or recorded elective admission category (assumed to be miscoded).* ***Under these assumptions, such patients are deemed included within measurement scope.*** 2) Among patients with multiple stroke episodes in a fiscal year meeting criteria in step 1) above, keep only their first chronological episode in the fiscal year.
Numerator	Number of patient episodes in the denominator cohort with thrombolysis recorded on any encounter in the episode. *Note: patient episodes with recorded thrombolysis that do not meet the criteria of the denominator cohort are not included in numerators.*
Calculation	Numerator / denominator
Technical definitions	• ED visits with recorded transfer to acute care are NACRS records with visit disposition codes *not in the following list*: '09', '30', '40', '90', '16', '17', '71', '72', '73', 74'. **Refer to Appendix Table 2** for definitions of NACRS visit disposition codes. • Encounters with recorded thrombolysis are DAD/NACRS records with a special project number '340' and character in position 3 = 'Y' or 'P'
Unit of Analysis	Patient and fiscal year combinations

	Note: this indicator is refreshed on a quarterly basis, but patients can only be reported at most once per fiscal year. Therefore, patients reported in an earlier quarter within a fiscal year are ineligible for subsequent quarterly reporting in the same fiscal year.
Adjustment	No *Note: prior to February 2026, this was a standardized indicator with adjustment for patients with type 2 (in-hospital) stroke. However, such patients are now excluded from measurement scope (except those with an in-hospital stroke preceded by a community onset stroke), so it is no longer necessary to report this indicator with standardization.*
Reporting Level(s)	• Province • Patient Ontario Health Region (OHR) • Patient "detailed" OHR Notes: • Postal codes are mapped to OHR definitions as of April 2023, i.e., aligned to the City of Toronto municipal boundaries • Patients with invalid or missing postal codes are excluded from OHR and "detailed" OHR-level results but are included in provincial totals • Facility-level reporting of this indicator is on pause
Target / Benchmark	Target: 12%
Interpretation	A higher value is desired
Other Notes	• This indicator does not exclude patients with missing SP340 data from the denominator. With historical improvements in SP340 data entry, most cases with missing data did not receive thrombolysis.

EVT Treatment Rate

Indicator Definition	The percentage of ischemic stroke patients who received endovascular thrombectomy/therapy (EVT).
Data Source(s)	Hyperacute Care Episode Cohort
Denominator	The denominator cohort are patient episodes defined by the following steps: 1) In each reported fiscal year, identify patients with at least one stroke episode in the Hyperacute Care Episode Cohort with *any* of the following: a) A cohort-comprising ED visit (i.e., meeting all criteria in step 1 of the Hyperacute Care Episode Cohort creation steps) *and without recorded transfer to acute care* b) A cohort-comprising acute admission (i.e., meeting all criteria in step 2 of the Hyperacute Care Episode Cohort creation steps) 2) Among patients with multiple stroke episodes in a fiscal year meeting criteria in step 1) above, keep only their first chronological episode in the fiscal year.
Numerator	Number of patient episodes in the denominator cohort with at least one admission during their episode of care where EVT was performed.
Calculation	Numerator / denominator
Technical definitions	• ED visits with recorded transfer to acute care are NACRS records with visit disposition codes *not in the following list*: '09', '30', '40', '90', '16', '17', '71', '72', '73', 74'. **Refer to Appendix Table 2** for definitions of NACRS visit disposition codes. • Admissions with EVT are identified by the presence of an EVT CCI code in any DAD intervention field that was not performed out of hospital. **Refer to Appendix Table 3** for a list of EVT codes.
Unit of Analysis	Patient and fiscal year combinations *Note: this indicator is refreshed on a quarterly basis, but patients can only be reported at most once per fiscal year. Therefore, patients reported in an earlier quarter within a fiscal year are ineligible for subsequent quarterly reporting in the same fiscal year.*
Adjustment	No
Reporting Level(s)	• Province • Patient Ontario Health Region (OHR) • Patient "detailed" OHR Notes: • Postal codes are mapped to OHR definitions as of April 2023, i.e., aligned to the City of Toronto municipal boundaries • Patients with invalid or missing postal codes are excluded from OHR and "detailed" OHR-level results but are included in provincial totals • Facility-level reporting of this indicator is on pause
Target / Benchmark	None
Interpretation	A higher value is desired

Median Door-to-Needle Time Among Ischemic Stroke Patients who Received Thrombolysis

Indicator Definition	The median time, in minutes, between an ischemic stroke patient's registration in the emergency department (ED) and the time intravenous thrombolysis was administered. This indicator is referred to as door-to-needle (DTN) time.
Data Source(s)	• Hyperacute Care Episode Cohort • NACRS
Cohort	Cohort creation steps: 1) Apply **step 1 only** of *Thrombolysis Treatment Rate*'s denominator cohort. This indicator shares the same cohort criteria as *Thrombolysis Treatment Rate's* denominator but without restricting to one stroke episode per patient in any fiscal year. 2) Restrict to patient episodes with at least one encounter with all the following: • Recorded thrombolysis • Recorded thrombolysis "needle" time that is valid and complete 3) Define a unique thrombolysis "needle" time for each patient episode. For episodes with thrombolysis recorded in multiple encounters, keep only the earliest valid "needle" time. 4) Calculate Door-to-Needle (DTN) for the episode: a. Pull all ED visits for the same patient within 1 day before the encounter with the unique thrombolysis "needle" time in step 3). For each such ED visit, flag their ED "door time" as earlier of its Registration Time or Triage Time. b. Calculate the episode's Door-to-Needle (DTN) time as the difference between the "needle" time and the latest ED door time *before* the "needle" time among those in step 4a). *Note: it is possible for the ED encounter with the latest "door time" before the "needle" time in step 4b) to also have recorded the "needle" time in step 3).* 5) Exclude patient episodes with any of the following: • Step 4) could not be completed, i.e., no candidate ED "door time" within 1 previous day could be found, *or* all candidate ED "door times" are after the "needle" time (resulting in negative DTN) • DTN calculated from step 4) is greater than 6 hours
Calculation	Median DTN in minutes
Technical definitions	• ED visits within 1 day before the encounter with the unique thrombolysis "needle" time must have all the following on the NACRS record: • Visit functional centre (VFC) code is for an ED visit: '71310', '72310', or '73310' • Visit is unscheduled • Encounters with recorded thrombolysis are DAD/NACRS records with a special project number (SPF) '340' and character in position 3 = 'Y' or 'P' • Thrombolysis "needle" time is identified in SPF 340 fields 04 – 11 (MMDDHHMM format). *Note: since the year of the thrombolysis "needle" time is not coded on SPF 340, it is necessary to back-calculate this using the entry date of the encounter with recorded SPF 340.*
Unit of Analysis	Patient episode
Adjustment	No

Reporting Level(s)	Province, Site and corresponding Facility Ontario Health Region Patient episodes are attributed to the hospital site whose ED door time was used to calculate DTN. This site is assumed to be the one where thrombolysis was administered and may differ from the one where SPF 340 was recorded.
Target / Benchmark	• Target: 30 minutes • Benchmarks are provided
Interpretation	• A lower value is desired • This indicator provides information on hospital response time following patient arrival at an ED with symptoms of stroke. Median values are compared to the provincial DTN target recommendation of 30 minutes. • Reference: Quality of Stroke Care in Canada. Stroke Key Quality Indicators and Stroke Case Definitions. Update 2016. Canadian Stroke Best Practices. Stroke Quality Advisory Committee. Heart and Stroke Foundation. August 2016.
Limitation(s)	• This indicator excludes patient episodes whose documentation of thrombolysis in SPF 340 occurred on a record without qualifying ischemic stroke diagnosis.
Other Notes	• CIHI special project 340 was mandated in Ontario as of April 1, 2012. Refer to CIHI coding directives for information on coding of 340 data.

Median Door-in/Door-out (DIDO) Time

<table>
<tr><td>Indicator Definition</td><td>The median time, in minutes, between the entry and exit time in the emergency department at a hospital with designated thrombolysis status (i.e., thrombolysis site) among ischemic/unspecified stroke patients transferred to an EVT site.</td></tr>
<tr><td>Data Sources</td><td>• Hyperacute Care Episode cohort
• DAD
• NACRS</td></tr>
<tr><td>Cohort</td><td>Cohort creation steps:

1) Pull stroke episodes from Hyperacute Care Episode Cohort with at least one cohort-comprising ED visit (i.e., meeting all criteria in step 1 of the Hyperacute Care Episode Cohort creation steps) that also meets all the following criteria:
• ED visit is at a designated thrombolysis site that is not also an EVT site
• The patient was subsequently transferred to an EVT hospital within 24 hours of presenting at the ED of the thrombolysis site. Put another way, the ED “door in” time (earlier of Registration and Triage Time on the thrombolysis site’s ED record) must be followed by an EVT “door in” time (earlier of Registration and Triage time if a subsequent ED visit at the EVT site is found, and Admission time at the EVT site if no such ED visit is found) within 24 hours.
2) Among episodes with multiple ED visits meeting criteria in step 1, keep only the ED visit with the shortest gap between its ED “door in” time and the subsequent EVT “door in” time.
3) From step 2), exclude ED visits with a missing or invalid “door out” time (earlier of disposition time and time left ED) only at thrombolysis sites that transfer patients to EVT sites by air transport. It is not necessary to apply this exclusion to thrombolysis sites that transfer patients to EVT sites by land transport. Refer to the “Calculation” section for further details.

Note: refer to List of Stroke Hospitals in Ontario in the Appendix for a complete list of EVT sites, thrombolysis sites, and their transport method to EVT sites.</td></tr>
<tr><td>Calculation</td><td>Median DIDO (see calculation details below) in minutes

DIDO is calculated using one of two methods depending on the thrombolysis site whose ED the patient presented at:

<table>
<tr><td>Does the thrombolysis site transfer patients to EVT sites by air transport or land transport?</td><td>DIDO calculation method:</td></tr>
<tr><td>Air transport</td><td>Method 1 (default):
Thrombolysis site ED “Door Out” time
– Thrombolysis site ED “Door In” time</td></tr>
<tr><td>Land transport</td><td>Method 2 (proxy method):</td></tr>
</table>
</td></tr>
</table>

	<table><tr><td></td><td>(EVT site “Door In” time - Thrombolysis site ED “Door In” time) – estimated ambulance drive time between Thrombolysis and EVT sites</td></tr></table> *Note: Recorded values of ED “Door Out” time at thrombolysis sites were incorrect for a significant proportion of the DIDO cohort, indicating potential data quality issues with this element. For this reason:* • *DIDO is calculated using a proxy method (Method 2) that does not rely on ED “Door Out” time for thrombolysis sites that transfer patients to EVT sites by land ambulance (> 90% of the DIDO cohort).* • *Method 2 estimates ambulance driving times between thrombolysis and EVT sites and subtracts this from the difference between the “Door In” times at the two sites. Ambulance driving times were estimated based on historical driving times in low traffic scenarios (e.g., at 3 AM on a weekday) to simulate modest time savings in normal scenarios from the use of lights and sirens to bypass traffic and speed limits.*
Technical definitions	• ED visits at the EVT site from which EVT “door times” are calculated must have all the following on the NACRS record: • Visit functional centre (VFC) code is for an ED visit: ‘71310’, ‘72310’, or ‘73310’ • Visit is unscheduled
Unit of Analysis	Patient episodes with transfer from a thrombolysis site’s ED to an EVT site
Adjustment	No
Reporting Level(s)	Province, transferring thrombolysis site and their corresponding Facility Ontario Health Region
Target / Benchmark	Target is 45 minutes. Reference: Heart and Stroke. (2022). Canadian Stroke Best Practices: Quality of Stroke Care in Canada Key Quality Indicators for Acute Stroke Management 7th Edition.
Interpretation	A lower value is desired
Limitations	• In absence of transfer purpose data, transfers from thrombolysis sites to EVT sites are assumed to be for EVT, however it is possible that some transfers may be for reasons other than EVT (e.g., stroke unit care) where timeliness may not be as critical. • Actual ambulance driving times vary from patient to patient and differ from the estimated constants used in Method 2 described in the “Calculation” section. This method will overestimate (underestimate) DIDO values for patients whose actual driving times are longer (shorter) than these estimates. Despite this limitation, Method 2 is still believed to be more accurate than Method 1 in most cases.

Median Time from Door Time at the EVT Hospital to qualifying CTA, CTP, or MRA

Indicator Definition	The median time, in minutes, between door time at the EVT hospital and qualifying CTA, CTP or MRA.
Data Source(s)	• Hyperacute Care Episode Cohort • DAD • NACRS

Cohort	Number of patient episodes in Hyperacute Care Episode Cohort with both of the following:
	• at least one admission where EVT was performed
	• first chronological EVT admission in the episode meeting all the following criteria:
	  • there is no type 2 ischemic stroke diagnosis on the admission record
	  • EVT scan was performed
	  • EVT scan time is valid, i.e., does not contain missing or invalid time values (e.g. 99', hours not between '00' and '24')
	  • Time from EVT "door time" to scan is within 6 hours, where EVT "door time" is the:
	  • earlier of the recorded Registration Time and Triage Time on the latest ED visit preceding – and located at the same site as – the EVT admission, if such an ED visit exists
	  • admission time of the EVT admission, if no such preceding ED visit exists

Calculation	Median (EVT Scan time - EVT Door time) in minutes

Technical definitions	• Admissions with EVT are identified by the presence of an EVT CCI code in any DAD intervention field that was not performed out of hospital. **Refer to Appendix Table 3** for a list of EVT codes.
	• ED visits at the EVT site from which EVT "door times" are calculated must have all the following on the NACRS record:
	  • Visit functional centre (VFC) code is for an ED visit: '71310', '72310', or '73310'
	  • Visit is unscheduled
	• Admissions where EVT scan was performed are DAD records with a special project number (SPF) '440' and character in position 1 (CTA, CTP or MRA Scan Performed Prior to Start of Endovascular Thrombectomy Intervention) = 'Y'
	• EVT scan time is identified in SPF 440 fields 02 – 09 (MMDDHHMM format). *Note: since EVT scan year is not coded on SPF 440, it is necessary to back-calculate this using EVT admission date.*

Unit of Analysis	Patient episodes with EVT
Adjustment	No
Reporting Level(s)	Province and EVT site
Target / Benchmark	Target is 15 minutes
Interpretation	A lower value is desired

Median Time from Door Time at the EVT Hospital to Arterial Puncture

Indicator Definition	The median time, in minutes, between door time at the EVT hospital and time the arterial access point is punctured.
Data Source(s)	• Hyperacute Care Episode Cohort • DAD • NACRS

Cohort	Number of patient episodes in Hyperacute Care Episode Cohort with both of the following:
	• at least one admission where EVT was performed
	• first chronological EVT admission in the episode meeting all the following criteria:
	  • there is no type 2 ischemic stroke diagnosis on the admission record
	  • EVT puncture time is valid, i.e., does not contain missing or invalid time values (e.g. 99', hours not between '00' and '24')
	  • Time from EVT "door time" to puncture is within 6 hours, where EVT "door time" is the:
	  • earlier of the recorded Registration Time and Triage Time on the latest ED visit preceding – and located at the same site as – the EVT admission, if such an ED visit exists
	  • admission time of the EVT admission, if no such preceding ED visit exists

Calculation	Median (EVT Puncture time - EVT Door time) in minutes

Technical definitions	• Admissions with EVT are identified by the presence of an EVT CCI code in any DAD intervention field that was not performed out of hospital. **Refer to Appendix Table 3** for a list of EVT codes.
	• ED visits at the EVT site from which EVT "door times" are calculated must have all the following on the NACRS record:
	  • Visit functional centre (VFC) code is for an ED visit: '71310', '72310', or '73310'
	  • Visit is unscheduled
	• EVT Puncture time is identified in special project number (SPF) '440' fields 10 – 15 (DDHHMM format). *Note: since EVT puncture month and year are not coded on SPF 440, it is necessary to back-calculate these using EVT admission date.*

Unit of Analysis	Patient episodes with EVT
Adjustment	No
Reporting Level(s)	Province and EVT site
Target / Benchmark	Target is 60 minutes
Interpretation	A lower value is desired but should be higher than time from hospital arrival to CTA.

Median Time from Door Time at the EVT Hospital to First Reperfusion

Indicator Definition	The median time, in minutes, between door time at the EVT hospital and first reperfusion.
Data Source(s)	• Hyperacute Care Episode Cohort • DAD • NACRS

Cohort	Number of patient episodes in Hyperacute Care Episode Cohort with both of the following:
	• at least one admission where EVT was performed
	• first chronological EVT admission in the episode meeting all the following criteria:
	  • there is no type 2 ischemic stroke diagnosis on the admission record
	  • EVT first reperfusion was achieved
	  • EVT first reperfusion time is *valid*, i.e., does not contain missing or invalid time values (e.g. 99', hours not between '00' and '24')
	  • Time from EVT "door time" to first reperfusion is within 6 hours, where EVT "door time" is the:
	  • earlier of the recorded Registration Time and Triage Time on the latest ED visit preceding – and located at the same site as – the EVT admission, if such an ED visit exists
	  • admission time of the EVT admission, if no such preceding ED visit exists

Calculation	Median (EVT First Reperfusion time - EVT Door time) in minutes

Technical definitions	• Admissions with EVT are identified by the presence of an EVT CCI code in any DAD intervention field that was not performed out of hospital. **Refer to Appendix Table 3** for a list of EVT codes.
	• ED visits at the EVT site from which EVT "door times" are calculated must have all the following on the NACRS record:
	  • Visit functional centre (VFC) code is for an ED visit: '71310', '72310', or '73310'
	  • Visit is unscheduled
	• Admissions where EVT first reperfusion was achieved are DAD records with a special project number (SPF) '440' and character in position 16 (First Reperfusion Achieved) = 'Y'
	• EVT first reperfusion time is identified in SPF 440 fields 17 – 22 (DDHHMM format). *Note: since EVT first reperfusion month and year are not coded on SPF 440, it is necessary to back-calculate these using EVT admission date.*

Unit of Analysis	Patient episodes with EVT
Adjustment	No
Reporting Level(s)	Province and EVT site
Target / Benchmark	Target is 90 minutes
Interpretation	A lower value is desired but should be higher than time from hospital arrival to arterial puncture time.
Limitations	Time from door to *final* reperfusion is preferred for performance monitoring, but SP440 only collects time of *first* reperfusion.

30-Day All-Cause Mortality Rate of EVT Patients

Indicator Definition	Mortality rate within 30 days after an EVT procedure per 100 patients.
Data Source(s)	• Hyperacute Care Episode Cohort • Decedent Cohort
Denominator	The denominator in each reported fiscal year is the number of unique people with at least one episode in the Hyperacute Care Episode Cohort with EVT performed. **Additional criteria:** 1) Among patients with multiple episodes in the Hyperacute Care Episode Cohort with EVT in the same fiscal year, keep in the denominator cohort only their first such episode in the fiscal year 2) Exclude from the denominator cohort patients with a death date erroneously recorded as before the EVT date
Numerator	Number of patients in the denominator who died within 30 days following EVT procedure date.
Calculation	Numerator / Denominator
Unit of Analysis	EVT patient and fiscal year combinations
Technical Definitions	Death date is sourced from Decedent Cohort, an internal Ontario Health information asset that identifies patient death using the following data assets: • DAD • NACRS • Continuing Care Reporting System (CCRS) • National Rehabilitation Reporting System (NRS) • Ontario Mental Health Reporting System (OMHRS) • Registered Persons Database (RPDB)
Adjustment	No
Reporting Level(s)	Province and EVT Site
Target / Benchmark	N/A
Interpretation	A lower value is desired
Limitations	Ideally this indicator would be risk-adjusted, however the low number of deaths limit ability to apply risk adjustment.

Outcomes for Stroke and TIA

Designated Stroke Unit Rate for Stroke/TIA Acute Patients

Note well: the methodology for this indicator will be updated in FY 2026/27. For the current methodology, please refer to an earlier version of the tech specs: "Stroke Report Tech Specs September 2025".

Risk-Adjusted 90-Day All-Cause Mortality Rate of Stroke/TIA Acute Patients

Indicator Definition	Risk-adjusted mortality rate within 90 days of admission for acute stroke or transient ischemic attack (TIA) per 100 patients.
Data Source(s)	• Acute Inpatient Episode Cohort • DAD • NACRS • Decedent Cohort
Denominator	The denominator in each reported fiscal year is the number of unique people with at least one episode in the Acute Inpatient Episode Cohort. **Additional criteria:** 1) Among patients with multiple episodes in the Acute Inpatient Episode Cohort in the same fiscal year, keep in the denominator cohort only their first episode in the fiscal year 2) Exclude from the denominator cohort patients with a death date erroneously recorded as before the earliest admission date in the episode
Numerator	Number of patient episodes in the denominator who died within 90 days of the first admission in the episode.
Calculation	**Crude (unadjusted) rate =** Numerator / Denominator * 100 **Model-based risk-adjusted rate (indirect standardization) =** (Crude Rate/Expected Rate) × Reference Crude Rate
Unit of Analysis	Patient and fiscal year combinations
Technical Definitions	Death date is sourced from Decedent Cohort, an internal Ontario Health information asset that identifies patient death using the following data assets: • DAD • NACRS • Continuing Care Reporting System (CCRS) • National Rehabilitation Reporting System (NRS) • Ontario Mental Health Reporting System (OMHRS) • Registered Persons Database (RPDB)
Adjustment	Indirect adjustment was applied using logistic regression models for hemorrhagic stroke, ischemic stroke and TIA with the following factors and significant interactions: • age • ambulance arrival • medical history of AFIB • medical history of hypertension • a Charlson Index score of 6+
Reporting Level(s)	• Province • Patient Ontario Health Region (OHR) • Patient “detailed” OHR Notes: • Postal codes are mapped to OHR definitions as of April 2023, i.e., aligned to the City of Toronto municipal boundaries

	• Patients with invalid or missing postal codes are excluded from OHR and "detailed" OHR-level results but are included in provincial totals
Target / Benchmark	N/A
Interpretation	A lower rate is desired

Reporting Considerations

Benchmarks

In some indicators, a "high performer" benchmark is using the Achievable Benchmarks of Care (ABC) method, as follows:

1. Care providers (hospitals) were ranked in order of performance on the indicator.
2. Beginning with the highest-performing provider, providers were added until at least 20% of the total number of patients were represented in the denominator.
3. The benchmark is the indicator result calculated among the subset of patients cared for at "high performers" identified in step 2 (which comprise at least 20% of all patients).

To ensure that high-performing providers with low numbers of patients did not unduly influence the benchmark rates, hospitals with a cohort size (denominator) of less than 30 were not included in the benchmark calculations.

Data Suppression

Data suppression is the masking of results as a requirement of Ontario's Personal Health Information Protection Act (PHIPA). There are two scenarios where data suppression is applied to Stroke Report indicators included in this document:

1. Low Volumes (LV): Volumes (counts) are between 1-5 ("small cell") in the denominator (cohort) or numerator of the original unmasked results. Masked results will appear as 'LV'.
2. Supplementary Suppression (SS): in some instances, additional cells with volumes greater than 5 must be suppressed to prevent back-calculation of 'LV' cells from sub-totals. Results suppressed for this reason will appear as 'SS'.

Appendix

Disclaimers and Acknowledgements

The aggregate data incorporated in the indicator reports and/or analytics products were provided by Ontario Health, a crown agency under the Ministry of Health. These reports, including any underlying source data or supplemental data and/or information, should not be shared with or disclosed to any individual or organization outside your regional stroke network partners, or re-printed or published, without seeking Ontario Health's prior written approval.

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List of Stroke Hospitals in Ontario

Institution name	Ambulatory (AM) site number	Acute Treatment (AT) site number	EVT status*	RSC, EDSC or DSC*	Thrombolysis Status*	Transfer method to EVT Site* (for Thrombolysis Sites only)	Stroke Unit Status*
Alexandra Marine and General Hospital	4082	1206			Y	Land	
Bluewater Health - Sarnia General	4109	4415		DSC	Y	Land	Y
Brant Community Healthcare System - Brantford	4679	4675		DSC	Y	Land	Y
Brightshores Health System - Owen Sound	4131	3944		DSC	Y	Land	Y
Brockville General Hospital - Charles St.	4186	1273			Y	Land	Y
Chatham-Kent Health Alliance - Chatham	4870	4871		DSC	Y	Land	Y
Cornwall Community Hospital	4452	4451		DSC	Y	Land	Y
Dryden Regional Health Centre	4248	2103			Y	Air	
Grand River Hospital Corporation - Waterloo	4107	3734		DSC	Y	Land	Y
Guelph General Hospital	4044	1946			Y	Land	Y
Halton Healthcare Services Corporation - Oakville	4192	3926					Y
Hamilton Health Sciences - General	4231	1982	Y	RSC	Y		Y
Hawkesbury and District General Hospital	4268	1777			Y	Land	
Health Sciences North - Laurentian	4063	4059	Y	RSC	Y		Y
Hopital Montfort	4130	1661					Y
Humber River Health - Wilson	4802	4799					Y
Huron Perth Healthcare Alliance - Stratford General Hospital	7557	7558		DSC	Y	Land	Y
Joseph Brant Hospital	4144	1160			Y	Land	Y
Kingston Health Sciences Centre - General	4832	4831	Y	RSC	Y		Y
Lake-Of-The-Woods District Hospital	4200	2110			Y	Air	
Lakeridge Health - Ajax	4845	4844			Y	Land	
Lakeridge Health - Oshawa	4171	3932		DSC	Y	Land	Y

London Health Sciences Centre - University	4310	3850	Y	RSC	Y		Y
Mackenzie Health - Cortelluucci Vaughan Hospital	5468	5469		DSC	Y	Land	Y
Muskoka Algonquin Healthcare - Huntsville	4618	4616		DSC	Y	Land	Y
Niagara Health System - Marotta Family Hospital	4045	4224					Closed September 2025
Niagara Health System - Niagara Falls Hospital	3982	4213		DSC	Y	Land	Y
North Bay Regional Health Centre	4734	4730		DSC	Y	Land	Y
North York General Hospital	4233	1330					Y
Northumberland Hills Hospital	4237	3860					Y
Notre Dame Hospital (Hearst)	4169	2082			Y	Air	
Oak Valley Health - Markham Stouffville Hospital	4235	3587					Y
Orillia Soldiers' Memorial Hospital	4108	1853					Y
Pembroke Regional Hospital	4071	1804		DSC	Y	Land	Y
Peterborough Regional Health Centre	4073	1768		DSC	Y	Land	Y
Queensway - Carleton Hospital	3970	1681					Y
Quinte Healthcare Corporation - Belleville	4097	3988		DSC	Y	Land	Y
Riverside Health Care Facility - La Verendrye	4124	2150			Y	Air	
Ross Memorial Hospital	4177	1893					Y
Royal Victoria Regional Health Centre	3987	1825		EDSC	Y	Land	Y
Sault Area Hospital - Sault Ste Marie	3972	4407		DSC	Y	Air	Y
Scarborough Health Network - Birchmount	4841	4842					Y
Sioux Lookout Meno-Ya-Win Health Centre	4137	4353			Y	Air	
Southlake Regional Health Centre	4001	2038					Y
St. Thomas-Elgin General Hospital	4076	1059		DSC			Y
Sunnybrook Health Sciences Centre	4205	3936	Y	RSC	Y		Y
Temiskaming Hospital	4264	2207			Y	Air	
The Ottawa Hospital - Civic	4079	4046	Y	RSC	Y		Y
The Sensenbrenner Hospital	4147	2088			Y	Air	
Thunder Bay Regional Health Sciences Centre	4315	3853	Y	RSC	Y		Y

Timmins and District General Hospital	4123	3414		DSC	Y	Air	Y
Toronto East Health Network - Michael Garron	4209	1302					Y
Trillium Health Partners - Mississauga	4756	4752	Y	RSC	Y		Y
Unity Health Toronto - St. Joseph's Health Centre	4857	4858					Y
Unity Health Toronto - St. Michael's Hospital	4864	4865	Y	RSC	Y		Y
University Health Network - Toronto Western	4266	3910	Y	RSC	Y		Y
Weeneebayko Area Health Authority - Moose Factory	4699	4698			Y	Air	
William Osler Health System - Brampton (Civic)	4685	4681			Y	Land	Y
William Osler Health System - Etobicoke	4245	3929			Y	Land	Y
Windsor Regional Hospital - Ouellette Campus	4774	4773	Y	EDSC	Y		Y

* as of FY 2025/26

Technical Appendix

Appendix Table 1: Stroke Diagnosis ICD-10CA Codes

Stroke Type	Code	Diagnosis Description
Hemorrhagic	I61	Intracerebral haemorrhage
Ischemic	H341	Central retinal artery occlusion
Ischemic	I63	Cerebral infarction
TIA	G45	Transient cerebral ischaemic attacks and related syndromes
TIA	H340	Transient retinal artery occlusion
Unspecified	I64	Stroke, not specified as haemorrhage or infarction
Excluded	G454	Transient global amnesia

Appendix Table 2: Discharge and Visit Disposition Codes*

Disposition	Data source	Code	Discharge or Visit Disposition Description
Transfer	NACRS	09	Transfer to another non-acute care facility directly from ambulatory care functional centre (e.g. stand-alone rehab, mental health)
Transfer	DAD	10	Inpatient Care
Transfer	DAD	20	Transfer to reporting or another facility for ED, day surgery or ambulatory care; includes nursing stations, although on occasion inpatients are also treated in such settings.
Transfer	DAD&NACRS	30	Residential Care
Transfer	DAD&NACRS	40	Group/Supportive Living
Transfer	DAD&NACRS	90	Correctional Facility
Discharge home	NACRS	16	Home with Support/Referral
Discharge home	NACRS	17	Private Home
Death	NACRS	71	Death on Arrival
Death	DAD&NACRS	72	Died in Facility
Death	DAD&NACRS	73	Medical Assistance in Dying (MAID)
Death	DAD&NACRS	74	Suicide in Facility
Sign-out	DAD	61	Absent without leave
Sign-out	DAD	62	Left against medical advice
Sign-out	DAD	65	Did not return from a pass
Sign-out	DAD	66	Died While on Pass/Leave
Sign-out	DAD	67	Suicide out of Facility
Sign-out	NACRS	61	Leave Post Registration
Sign-out	NACRS	62	Leave Post Initial Treatment
Sign-out	NACRS	63	Left after Triage
Sign-out	NACRS	64	Left After Initial Assessment

*as of FY 2018/19 and onward

Appendix Table 3: EVT CCI codes and description

- 1.JE.57.GQ* (Extraction, carotid artery using percutaneous transluminal approach Includes mechanical thrombectomy, carotid artery)
- 1.JW.57.GP.GX (Extraction, other vessels of head, neck and spine NEC, using percutaneous transluminal approach and device NEC)
- 1.JW.57.GQ* (Extraction, intracranial vessels using percutaneous transluminal approach and device NEC Includes mechanical thrombectomy, intracranial artery)
- 1.JX.57.GP* (Extraction, other vessels of head, neck and spine NEC, using percutaneous transluminal approach and device NEC, Includes Mechanical Thrombectomy, extracranial vessels of head neck and spine)