



**Ontario Health**  
CorHealth Ontario

# Stroke Report Technical Specifications

Released: September 2025

Updated: February 2026

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## Section 1: Cohort Methodology

### Hyperacute Care Cohorts

The cohorts for Stroke Report Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke, the hyperacute care indicators are fundamentally different from the cohorts used for acute care stroke and TIA performance. The stroke and TIA acute care cohorts are defined to enhance the homogeneity of cohort patients by focusing only on the first (index) stroke or TIA admission in a given fiscal year that has an MRDx of stroke or TIA and the stroke or TIA occurred prior to admission to acute care.

The hyperacute care cohort has been designed to capture all actual and potential EVT patients and includes:

- Ischemic stroke patients whose MRDx may not have been a stroke diagnosis
- Patients whose ischemic stroke occurred after admission to acute care.

Therefore, the cohorts and methodologies are defined separately for hyperacute care performance indicators in the stroke report, with the exception of Median Door-to-Needle Time Among Stroke/TIA Patients who Received tPA. This indicator does not use the stroke definition in the Hyperacute cohort. It instead uses the cohorts for all other Performance Indicators.

Hyperacute Care EVT Cohort

<b>Description</b>	Adult ischemic stroke cases residing in Ontario who received an endovascular thrombectomy/therapy (EVT) procedure
<b>Data Source(s)</b>	Discharge Abstract Database (DAD)
<b>Inclusion Criteria</b>	<p>Records meeting <b>all</b> of the following criteria:</p> <ul style="list-style-type: none"> <li>• Discharge dates within reporting period</li> <li>• Valid Ontario health card number and responsibility for payment</li> <li>• 18 &lt;= Age &lt;=108</li> <li>• Procedures from EVT hospitals with an institution number in <b>List of EVT Hospitals in Ontario</b></li> <li>• ICD-10-CA any diagnosis (DX_CODE) = <b>I63*</b> (including all sub-codes except <b>I636</b>), <b>I64*</b> or <b>H341</b></li> <li>• CCI Intervention Codes in any intervention field (<b>FY2012/13 - FY2017/18</b>):             <ul style="list-style-type: none"> <li>○ <b>1.JW.57.GP.GX</b> (Extraction, other vessels of head, neck and spine NEC, using percutaneous transluminal approach and device NEC)</li> <li>○ <b>1.JX.57.GP.GX</b> (Extraction, intracranial vessels using percutaneous transluminal approach and device NEC. Includes mechanical thrombectomy), or</li> <li>○ <b>1.JE.57.GQ*</b> (Extraction, carotid artery using percutaneous transluminal approach. Includes mechanical thrombectomy)</li> </ul> </li> <li>• CCI codes in any intervention field (as of <b>FY2018/19</b>):             <ul style="list-style-type: none"> <li>○ <b>1.JE.57.GQ*</b> (Extraction, carotid artery using percutaneous transluminal approach Includes mechanical thrombectomy, carotid artery)</li> <li>○ <b>1.JW.57.GQ*</b> (Extraction, intracranial vessels using percutaneous transluminal approach and device NEC. Includes mechanical thrombectomy, intracranial artery)</li> <li>○ <b>1.JX.57.GP*</b> (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)</li> </ul> </li> </ul>
<b>Exclusion Criteria</b>	Out of hospital interventions
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• NACRS also had EVT records but all were also recorded in DAD on the same day. Therefore, no new EVT cases was added in the cohort.</li> <li>• KHSC operated 24/7 in September 2017. TBRHSC started operating in 2018 and is not 24/7. WRH operated 24/7 in 2020 and HSN operated 24/7 in 2021. All other EVT hospitals operated 24/7 from FY2017/18 to present.</li> </ul>

### Hyperacute Care Emergency Department Cohort

<b>Description</b>	Visits to the emergency department (ED) for ischemic stroke within the fiscal year based on registration date for adults living in Ontario
<b>Data Source(s)</b>	National Ambulatory Care Reporting System (NACRS)
<b>Inclusion Criteria</b>	Records meeting <b>all</b> of the following criteria: <ul style="list-style-type: none"> <li>• Registration dates within reporting period</li> <li>• Visit functional centre (VFC) codes for an ED visit ('71310', '72310', '73310')</li> <li>• Valid Ontario health card number and responsibility for payment</li> <li>• 18 &lt;= Age &lt;= 108</li> <li>• ICD-10-CA any diagnosis as <b>I63</b> (including all sub-codes except I63.6), <b>I64</b> or <b>H34.1</b></li> </ul>
<b>Exclusion Criteria</b>	Records meeting <b>any</b> of the following criteria: <ul style="list-style-type: none"> <li>• ICD-10-CA any diagnosis as <b>I63.6</b></li> <li>• Cases when any diagnosis of <b>I63*</b> (exclude <b>I63.6</b>) or <b>I64*</b> or <b>H34.1</b> is recorded by the physician as questionable and no other ischemic stroke diagnosis</li> <li>• Scheduled visits</li> </ul>
<b>Other Notes</b>	

### Hyperacute Care Acute Inpatient Cohort

<b>Description</b>	Acute inpatient admissions for ischemic stroke within the fiscal year based on discharge date for adults living in Ontario
<b>Data Source(s)</b>	Discharge Abstract Database (DAD)
<b>Inclusion Criteria</b>	Records meeting <b>all</b> of the following criteria: <ul style="list-style-type: none"> <li>• Discharge dates within reporting period</li> <li>• Valid Ontario health card number and responsibility for payment</li> <li>• 18 &lt;= Age &lt;= 108</li> <li>• ICD-10-CA any diagnosis as <b>I63</b> (including all sub-codes except <b>I63.6</b>), <b>I64</b> or <b>H34.1</b></li> </ul>
<b>Exclusion Criteria</b>	Records meeting <b>any</b> of the following criteria: <ul style="list-style-type: none"> <li>• ICD-10-CA any diagnosis as <b>I63.6</b></li> <li>• Exclude Type 3 Diagnosis (Secondary Diagnosis). Hierarchy of diagnosis type: M&gt;1&gt;2&gt;3&gt;others, so no repeat cases were counted</li> </ul>
<b>Other Notes</b>	

## Cohorts for all Other Performance Indicators

### Emergency Department Cohort

<b>Description</b>	Visits to the emergency department (ED) for the first stroke/TIA event within the fiscal year based on registration date for adults living in Ontario
<b>Data Source(s)</b>	National Ambulatory Care Reporting System (NACRS)
<b>Inclusion Criteria</b>	Records meeting <b>all</b> of the following criteria: <ul style="list-style-type: none"> <li>• Registration dates within reporting period</li> <li>• Any of the following most responsible diagnosis (MRDx) ICD-10CA codes: G45, H340, H341, I60, I61, I63, or I64 <ul style="list-style-type: none"> <li>○ See <b>Appendix Table 1</b> for details</li> </ul> </li> <li>• Management Information System (MIS) visit functional centre maps to ED: 71310, 72310, or 73310</li> <li>• First stroke/TIA event in fiscal year based on registration date</li> </ul>
<b>Exclusion Criteria</b>	Records meeting <b>any</b> of the following criteria: <ul style="list-style-type: none"> <li>• Age less than 18 at time of ED visit</li> <li>• Non-Ontario funding or non-Ontario health card</li> <li>• Any of the following MRDx codes: G454, I608, or I636 <ul style="list-style-type: none"> <li>○ See <b>Appendix Table 1</b> for details</li> </ul> </li> <li>• Questionable diagnosis</li> <li>• Scheduled ED Visits</li> <li>• Disposition codes indicating sign-outs against medical advice or left before being seen <ul style="list-style-type: none"> <li>○ See the 'Sign-out' category in <b>Appendix Table 2</b></li> </ul> </li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• Follow-up for indicator outcomes may extend beyond the index fiscal year</li> </ul>

## Acute Inpatient Cohort

<b>Description</b>	Acute inpatient admissions for the first stroke/TIA event within the fiscal year based on discharge date for adults living in Ontario
<b>Data Source(s)</b>	Discharge Abstract Database (DAD)
<b>Inclusion Criteria</b>	<p>Records meeting <b>all</b> of the following criteria:</p> <ul style="list-style-type: none"> <li>• Discharge dates within reporting period</li> <li>• Any of the following most responsible diagnosis (MRDx) ICD-10CA code: G45, H340, H341, I60, I61, I63, or I64 <ul style="list-style-type: none"> <li>○ See <b>Appendix Table 1</b> for details</li> </ul> </li> <li>• First stroke/TIA event in fiscal year based on discharge date</li> </ul>
<b>Exclusion Criteria</b>	<p>Records meeting <b>any</b> of the following criteria:</p> <ul style="list-style-type: none"> <li>• Age less than 18 at time of admission into acute care</li> <li>• Non-Ontario funding or non-Ontario health card</li> <li>• Any of the following MRDx: G454, I608, or I636 <ul style="list-style-type: none"> <li>○ See <b>Appendix Table 1</b> for details</li> </ul> </li> <li>• In-hospital or post-admission stroke diagnosis (Type 2 diagnosis)</li> <li>• Elective admission</li> <li>• Palliative care diagnosis prior to admission <ul style="list-style-type: none"> <li>○ ICD-10CA = Z515 in any of the 25 diagnosis fields</li> <li>○ Corresponding diagnosis prefix code = 8</li> </ul> </li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• Follow-up for post-acute indicator outcomes may extend beyond the index fiscal year</li> </ul>

Measurement of AlphaFIM Stroke Severity in the Acute Inpatient Cohort

<b>Description</b>	A measure of disability from stroke in acute care based on the AlphaFIM																											
<b>Data Source(s)</b>	DAD																											
<b>Methodology</b>	<p>Stroke severity groups are mutually exclusive subsets of the index stroke cohort derived from the Special Project 740 field, as structured:</p> <table border="1" data-bbox="483 409 1372 499"> <tr> <td><b>Position</b></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> <td>11</td> <td>12</td> <td>13</td> </tr> <tr> <td><b>Value</b></td> <td>Y/N</td> <td colspan="3">Year</td> <td colspan="2">Month</td> <td colspan="2">Day</td> <td colspan="2">MR</td> <td colspan="2">CR</td> </tr> </table> <ul style="list-style-type: none"> <li>• Among the 25 special project number variables in DAD, identify the variable containing '740'</li> <li>• Use the corresponding special project field variable to calculate the date of assessment using the following:             <ul style="list-style-type: none"> <li>○ Convert characters in positions 2-5 to a 4-digit year if they do not contain '99' or '9999'</li> <li>○ Convert characters in positions 6-7 to a month where '01' corresponds to January, '02' corresponds to February and '12' corresponds to December</li> <li>○ Convert characters in positions 8-9 to days of the month</li> </ul> </li> <li>• Use the corresponding special project field variable to calculate the AlphaFIM (stroke severity) score based on the following:             <ul style="list-style-type: none"> <li>○ Documentation of Alpha FIM Scores (first position) = 'Y'</li> <li>○ Convert characters in positions 10-11 to a projected motor rating score between 13 and 91 (inclusive)</li> <li>○ Convert characters in positions 12-13 to a projected cognitive rating score between 5 and 25 (inclusive)</li> <li>○ If both motor rating and cognitive rating scores are not missing, sum them to derive AlphaFIM</li> </ul> </li> <li>• If the date components correspond to a proper date that is between admission and discharge, map the AlphaFIM score to severity group in <b>Appendix Table 3</b></li> </ul>	<b>Position</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	<b>Value</b>	Y/N	Year			Month		Day		MR		CR	
<b>Position</b>	1	2	3	4	5	6	7	8	9	10	11	12	13															
<b>Value</b>	Y/N	Year			Month		Day		MR		CR																	
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• The AlphaFIM may not be completed at the index hospital if the stroke patient only stayed 24-48 hours. It will be completed at the receiving acute hospital within that admission.</li> </ul>																											

Post-acute Sub-cohort

<b>Description</b>	This is a subset of the acute inpatient cohort excluding patients who died during the acute inpatient admission at either the <b>index</b> or transfer hospital. Only patients discharged alive are applicable to outcomes that require follow-up post-discharge.
<b>Data Source(s)</b>	DAD
<b>Inclusion / Exclusion Criteria</b>	<p><b>Inclusion/Exclusion:</b> Same as Acute Inpatient Cohort</p> <p><b>Additional Exclusions:</b></p> <ul style="list-style-type: none"> <li>Disposition codes in ‘Death’ category in <b>Appendix Table 2</b> in any acute record related to the first stroke/TIA event</li> </ul> <p>Note: Some patients may be transferred multiple times during their acute care related to the first stroke event. The <b>final discharge date</b> is based on the last discharge from acute care.</p>

Post-acute Rehabilitation-Eligible Cohort

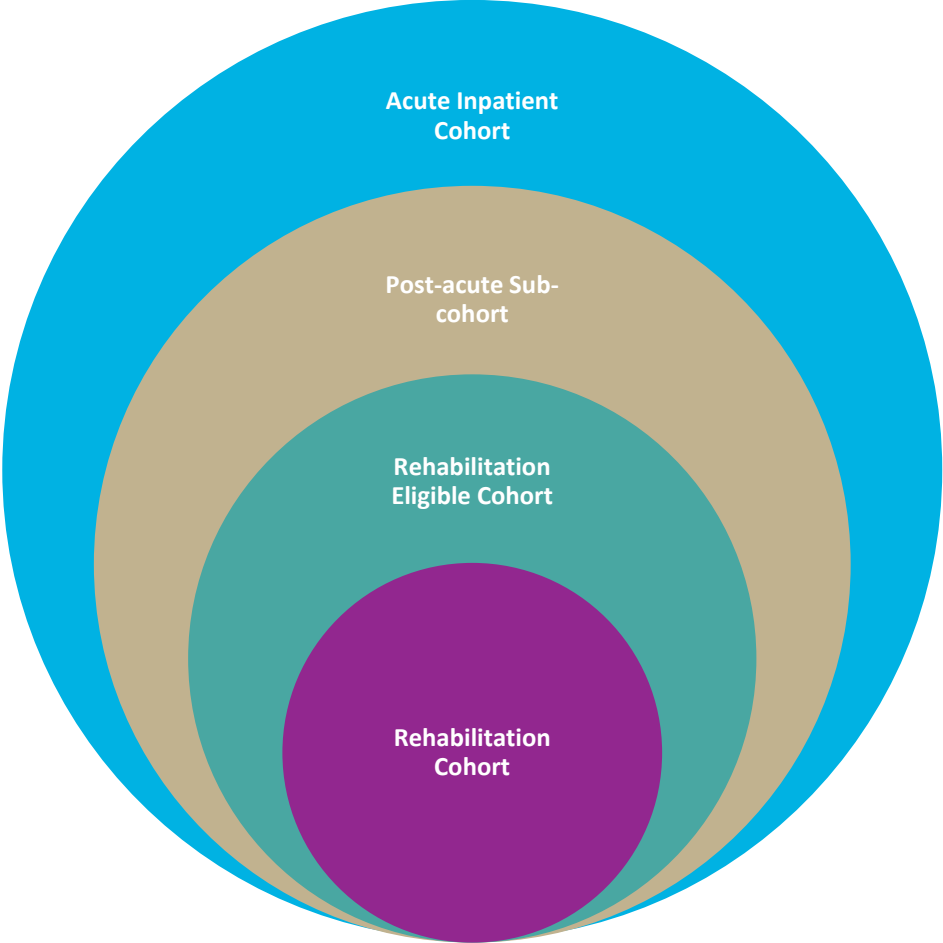
<b>Description</b>	The Rehabilitation Eligible cohort is a subset of the Post-acute sub-cohort, further excluding patients who died in-hospital or signed themselves out at either the index or transfer acute hospital. Only these patients are considered eligible for post-acute rehab, and thus, included for the post-acute rehab indicators.
<b>Data Source(s)</b>	DAD
<b>Inclusion / Exclusion Criteria</b>	<p><b>Inclusion/Exclusion:</b> Same as Post-acute Sub-cohort</p> <p><b>Additional Exclusions:</b></p> <ul style="list-style-type: none"> <li>In-hospital deaths at either index or transfer acute hospital</li> <li>Sign-out from either index or transfer hospital as determined by their discharge disposition (See <b>Appendix Table 2</b>)</li> <li>TIA strokes</li> </ul> <p>Notes: See <b>Figure 1</b> for a diagram of the hierarchy of stroke cohorts</p>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Some patients are transferred to another acute facility prior to admission to IP rehab. To maximize the capture of these patients, the final discharge date from acute care is used.</li> </ul>

Post-acute Rehabilitation Cohort

<p><b>Description</b></p>	<p>The post-acute rehabilitation cohort includes patients who <b>received</b> any of the following:</p> <ul style="list-style-type: none"> <li>• Inpatient Rehab (IP Rehab)</li> <li>• Home-based Rehab (HB Rehab)</li> </ul>																																								
<p><b>Data Source(s)</b></p>	<ul style="list-style-type: none"> <li>• National Rehabilitation Reporting System (NRS)</li> <li>• Home Care Database (HCD), Client Health and Related Information System (CHRIS)</li> </ul>																																								
<p><b>Inclusion / Exclusion Criteria</b></p>	<p><b>IP Rehab Cohort</b>            Patients satisfying all of the following criteria:</p> <ul style="list-style-type: none"> <li>• Rehabilitation client group (RCG) indicates stroke (values '1.1' to '1.9')</li> <li>• Admission Class Code is not "4 = [Un]planned Discharge without assessment"</li> </ul> <p><b>FIM Motor Score</b>            The sum of admitting FIM motor components related to eating, grooming, bathing, dressing upper body, dressing lower body, bowel, bladder, transferring to bed, transferring to toilet, locomotion and locomotion on stairs</p> <p><b>FIM Cognitive Score</b>            The sum of admitting FIM cognitive components related to comprehension, expression, social interaction, problem solving and memory</p> <p>The final stroke disability at admission into IP rehab is based on the following mapping:</p> <table border="1" data-bbox="483 1129 1344 1478"> <thead> <tr> <th>FIM Motor Score</th> <th>FIM Cognitive Score</th> <th>Age</th> <th>RPG</th> <th>Disability</th> </tr> </thead> <tbody> <tr> <td>69 to 84</td> <td>30 to 35</td> <td>-</td> <td>1160</td> <td>Mild</td> </tr> <tr> <td>51 to 68</td> <td>30 to 35</td> <td>-</td> <td>1150</td> <td>Mild</td> </tr> <tr> <td>&gt; 50</td> <td>26 to 29</td> <td>-</td> <td>1140</td> <td>Moderate</td> </tr> <tr> <td>&gt; 50</td> <td>5 to 25</td> <td>-</td> <td>1130</td> <td>Moderate</td> </tr> <tr> <td>39 to 50</td> <td>-</td> <td>-</td> <td>1120</td> <td>Moderate</td> </tr> <tr> <td>12 to 38</td> <td>-</td> <td>69+</td> <td>1110</td> <td>Severe</td> </tr> <tr> <td>12 to 38</td> <td>-</td> <td>&lt; 69</td> <td>1100</td> <td>Severe</td> </tr> </tbody> </table> <p><i>Source: CIHI (2016). RPG Grouping Methodology and Weights, 2016–2017 NRS Version</i></p> <p>Note: The FIM motor score used to calculate RPG does not include the component for "Transferring to shower." This was previously noted as a subtraction instead of exclusion in prior Stroke Report Cards.</p> <p><b>HB Rehab Cohort</b>            Patients satisfying all of the following criteria:</p> <ul style="list-style-type: none"> <li>• Received their first HB rehab visit within 60 days following the final discharge from acute care or IP rehab</li> </ul>	FIM Motor Score	FIM Cognitive Score	Age	RPG	Disability	69 to 84	30 to 35	-	1160	Mild	51 to 68	30 to 35	-	1150	Mild	> 50	26 to 29	-	1140	Moderate	> 50	5 to 25	-	1130	Moderate	39 to 50	-	-	1120	Moderate	12 to 38	-	69+	1110	Severe	12 to 38	-	< 69	1100	Severe
FIM Motor Score	FIM Cognitive Score	Age	RPG	Disability																																					
69 to 84	30 to 35	-	1160	Mild																																					
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39 to 50	-	-	1120	Moderate																																					
12 to 38	-	69+	1110	Severe																																					
12 to 38	-	< 69	1100	Severe																																					

	<ul style="list-style-type: none"> <li>• Received <b>at least three</b> HB rehab visits within 180 days following first HB rehab visit</li> <li>• Included HB rehab services for stroke: <ul style="list-style-type: none"> <li>○ 5 = Physiotherapy (PT)</li> <li>○ 6 = Occupational therapy (OT)</li> <li>○ 7 = Speech language therapy (SLP)</li> <li>○ 8 = Social work (SW)</li> </ul> </li> </ul> <p>Notes: See <b>Figure 1</b> for a diagram of the hierarchy of stroke cohorts</p>
<p style="color: blue;">Other Notes</p>	<ul style="list-style-type: none"> <li>• For FY2024/25 and prior, outpatient rehab (OP rehab) data are not available for stroke patients in NACRS Clinic-Lite. For these fiscal years, post-acute rehab captures only IP rehab and HB Rehab.</li> <li>• HB rehab in CHRIS only captures home care provided by Ontario Health at Home.</li> <li>• HCD records indicate that some visits occur while a patient is still admitted in an IP rehab facility.</li> <li>• Post-acute rehab activity may occur in the index and subsequent fiscal year (i.e., span multiple fiscal years).</li> <li>• This cohort is generally a subset of post-acute rehab-eligible cohort, except for “Standardized Active Length of Stay in Inpatient Rehabilitation” and “Median Number of Minutes per Day of Direct Therapy Received by IP Rehab Patients” which can include patients not directly admitted from acute care</li> <li>• A minimum of 3 HB rehab visits were implemented to exclude patients who most likely received only assessment visits and not actual rehab visits. This criterion will lead to a reduction in the number of patients receiving HB rehab, but an increase in the mean number of visits.</li> </ul>

**Figure 1: Cohort Hierarchy**



## Section 2: Indicator Methodologies

### Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario

#### SR1-1: Standardized Stroke and TIA Admission Rate to Acute Care per 1000 Population

<b>Indicator Definition</b>	Age and sex standardized inpatient admission rate for acute stroke and transient ischemic attack (TIA) per 1,000 population
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>Registered Persons Database (RPDB)</li> </ul>
<b>Denominator</b>	Number of Ontario residents in RPDB 18 years old or older, and alive as of July 1 of each fiscal year.
<b>Numerator</b>	Number of patients (index admissions) in the acute inpatient stroke cohort
<b>Calculation</b>	<p><b>Crude (unadjusted) rate (per age-sex category) =</b></p> $\frac{\text{Number of patients in acute inpatient stroke cohort}}{\text{Number of alive adults in Ontario}} \times 1000$ <p><b>Adjusted rate (direct standardization) =</b></p> $\sum_{\text{All Age-Sex Groups}} (\text{Crude Rate}) \times \text{Provincial Population Proportion}$
<b>Unit of Analysis</b>	Patients (Stroke Acute Admissions)
<b>Adjustment</b>	<p>Age and sex direct standardization to the Ontario July 1, 2020, population</p> <p>Age groups for provincial results: 18-49, 50-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89 and 90+</p> <p>Age groups for Ontario Health Region results: 18-59, 60-69, 70-79, 80-89, 90+</p>
<b>Reporting Level(s)</b>	Province, and Patient Ontario Health Region
<b>Target/Benchmark</b>	N/A
<b>Interpretation</b>	The rate of admission reflects population demographics and the effectiveness of primary and secondary prevention programs. A lower rate is desired.
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Only the first stroke/TIA event a patient had in the fiscal year is included.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This is a population-based indicator. The patient's postal code is used to report Regional performance.</li> <li>The rate of admission to hospital reflects population demographics and primary prevention efforts, for example, control of hypertension and smoking cessation programs.</li> <li>Excludes cases under 18, cases with non-Ontario postal code, cases with missing postal code or cases with invalid postal code (not mapped to Ontario regions)</li> <li>Cases from the stroke cohort are matched to the ON population for the same fiscal year first. If match is not found, ON population for the pervious fiscal year, and following fiscal year is searched for the match.</li> <li>For matched cases, patient information from the stroke cohort is used for analysis</li> </ul>

SR1-2: Rate of Stroke Prevention Services Referral of Stroke & TIA ED Visits Discharged Home

<b>Indicator Definition</b>	Proportion of ischemic stroke and transient ischemic attack (TIA) patients discharged from ED who were referred to stroke prevention services (SPS), per 100 persons
<b>Data Source(s)</b>	National Ambulatory Care Reporting System (NACRS)
<b>Denominator</b>	<p>Number of stroke/TIA patients from the stroke ED cohort, with these additional inclusion and exclusion criteria:</p> <p><b>Inclusion:</b> Patients discharged home alive, based on the following Visit Disposition codes:</p> <ul style="list-style-type: none"> <li>• '01' = Discharged Home (private dwelling, not an institution; no support services) – FY2017/18 and earlier</li> <li>• '16' = Home with Support/Referral – FY2018/19 and after</li> <li>• '17' = Private Home – FY2018/19 and after</li> </ul>
<b>Numerator</b>	<p>The number of acute ischemic stroke/TIA patients identified in the denominator who were given an SPS referral on discharge from the ED:</p> <ul style="list-style-type: none"> <li>• Among the 25 special project number field, identify the variable containing '340'</li> <li>• Using the corresponding special project data field, a value of the second character = 'Y'</li> </ul>
<b>Calculation</b>	$\frac{\text{Number of patients who referred to secondary prevention}}{\text{Number of ED stroke patients discharged home alive}}$
<b>Unit of Analysis</b>	Patient (Stroke ED Visit)
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index ED Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>• Only the first stroke or TIA visit to the ED that a patient had in the fiscal year is considered for potential inclusion.</li> <li>• This indicator compiles the number of referrals made but cannot determine the number of patients seen in secondary prevention clinics and/or who received secondary prevention services.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• Patients with missing special project 340 information (i.e., records with no value of '340' in any of the 25 special project number fields) were previously excluded from reporting. In the updated methodology, these patients are assumed to <b>not</b> have received secondary prevention referral.</li> </ul>

**SR1-3: Anticoagulant Rx within 90 Days for Ischemic Stroke or TIA Patients 65+ with AFIB**  
**This indicator was not calculated for this year's release.**

<b>Indicator Definition</b>	The rate per 100 ischemic stroke and transient ischemic attack (TIA) patients 65 years and older with atrial fibrillation who filled a prescription for oral anticoagulant therapy within 90 days of discharge from acute care.
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>Ontario Drug Benefit (ODB)</li> <li>Registered Persons Database (RPDB)</li> </ul>
<b>Denominator</b>	<p>Number of stroke patients discharged alive from acute care and meeting all the following criteria:</p> <ul style="list-style-type: none"> <li>Aged 65 or older at time of admission</li> <li>Has a 3-year history of atrial fibrillation (Afib) in acute care <ul style="list-style-type: none"> <li>Previous acute discharge is within 1,095 days of index stroke acute discharge</li> <li>An ICD10-CA code of 'I48' in any of diagnosis code field</li> </ul> </li> </ul>
<b>Numerator</b>	<p>Number of patients (from the denominator) that filled a prescription for anticoagulant therapy within 90 days of acute discharge</p> <ul style="list-style-type: none"> <li>ODB service date is within 90 days of acute discharge (inclusive)</li> <li>Drug Identification Number (DIN) maps to an oral anticoagulant drug in <b>Appendix Table 6</b></li> </ul>
<b>Calculation</b>	$\frac{\text{Number of patients prescribed anticoagulants after discharge}}{\text{Number of acute stroke patients 65 + with Afib and discharged alive}}$
<b>Unit of Analysis</b>	Patient (Stroke Acute Admissions)
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Prescription drug information data are not available for those under 65 years of age.</li> <li>Patients with contraindications for anticoagulants are included.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This is a population-based indicator. The patient's postal code is used to report Regional performance.</li> <li>Includes stroke diagnosis I64 ('unspecified').</li> </ul>

SR1-4: Carotid Imaging Rate for Ischemic Stroke Patients Admitted to Acute Care

<b>Indicator Definition</b>	The proportion of acute ischemic stroke patients who received any one of the following carotid imaging procedures during their inpatient stay: carotid Doppler, carotid computed tomography angiography (CTA), carotid magnetic resonance angiography (MRA) or carotid angiography, per 100 acute ischemic stroke discharges
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>National Ambulatory Care Reporting System (NACRS)</li> <li>Ontario Health Insurance Plan (OHIP)</li> </ul>
<b>Denominator</b>	Number of <b>ischemic</b> patients in the acute inpatient stroke cohort
<b>Numerator</b>	<p>Number of patients who received carotid imaging as identified in either OHIP or NACRS.</p> <p>OHIP records meeting all of the following:</p> <ul style="list-style-type: none"> <li>Billing (fee) code maps to carotid imaging in <b>Appendix Table 4</b></li> <li>Service date between acute admission and discharge (inclusively)</li> </ul> <p>NACRS records meeting all of the following:</p> <ul style="list-style-type: none"> <li>Procedure (CCI) code within any of the intervention code fields mapping to carotid imaging in <b>Appendix Table 5</b></li> <li>Registration date is within 1 day prior to acute admission</li> </ul>
<b>Calculation</b>	$\frac{\text{Number of patients who received carotid imaging}}{\text{Number of acute ischemic stroke patients}}$
<b>Unit of Analysis</b>	Patients (Stroke Acute Admissions)
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Coding of diagnostic imaging in NACRS is mandatory while optional in DAD unless the procedure is the sole intervention performed in the presence of an anesthetist.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Carotid imaging is necessary when endovascular therapy (EVT) is being considered. Even in patients not considered candidates for EVT or intravenous thrombolysis, vascular imaging is recommended to guide management for secondary prevention of future stroke.</li> <li>Includes stroke diagnosis I64 ('unspecified').</li> </ul>

SR1-5: Standardized Rate of Ambulance Arrival to the Emergency Department

<b>Indicator Definition</b>	The rate per 100 stroke/TIA visits that arrive by ground, or a combination of ground and air ambulance to the emergency department (ED)
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>National Ambulatory Care Reporting System (NACRS)</li> <li>Registered Persons Database (RPDB)</li> </ul>
<b>Denominator</b>	Number of stroke/TIA patients from the stroke ED cohort
<b>Numerator</b>	<p>The number of stroke/TIA patients identified in the denominator arriving to the ED by ambulance where the arrival code is any of the following:</p> <ul style="list-style-type: none"> <li>'A' (Air ambulance)</li> <li>'C' (Combination of ground and air ambulance)</li> <li>'G' (Ground ambulance)</li> <li>'W' (Water Ambulance) [applicable prior to 2003/04]</li> </ul>
<b>Calculation</b>	<p><b>Crude (unadjusted) rate =</b>  <math display="block">\frac{\text{Number of patients who arrived by ambulance}}{\text{Number of ED stroke patients}}</math></p> <p><b>Model-based risk-adjusted rate (indirect standardization) =</b>          (Crude Rate/Expected Rate) * Provincial Crude Rate</p>
<b>Unit of Analysis</b>	Patient Stroke ED
<b>Adjustment</b>	Indirect adjustment for Stroke Type
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index ED Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	Suspected stroke/TIA requires immediate medical attention. Ambulance transport is quicker than other modes of transportation. A higher proportion of patients arriving by ambulance suggests patients have a better chance of receiving timely medical care.
<b>Limitation(s)</b>	Only the first stroke or TIA visit to the ED that a patient had in the fiscal year is included.
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This is a population-based indicator. The patient's postal code is used to report Regional performance.</li> </ul>

## **Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke**

### **SR2-1: Ischemic Stroke Hyperacute Treatment Rate**

*New as of February 2026: the methodologies for Thrombolysis Treatment Rate and EVT Treatment Rate have been updated. Please refer to the latest version of the tech specs for the updated methodologies.*

## SR2-2: Median Door-to-Needle Time Among Stroke/TIA Patients who Received Thrombolysis

*New as of February 2026: the methodology for this indicator has been updated. Please refer to the latest version of the tech specs for the updated methodology.*

SR2-3: EVT Rate for Ischemic Stroke Patients Transferred from a DSC/thrombolysis ED to an EVT Facility

<b>Indicator Definition</b>	Percentage of ischemic stroke patients transferred from the ED of a designated stroke centre (DSC) or tPA hospital to an EVT hospital who received an EVT
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>National Ambulatory Care Reporting System (NACRS)</li> </ul>
<b>Denominator</b>	<p>Number of ischemic stroke patients who had an ED visit from the Hyperacute cohort</p> <p><b>Include:</b></p> <ul style="list-style-type: none"> <li>Records with an AM institution number from the list of DSC/thrombolysis hospitals in <b>List of Stroke Hospitals in Ontario</b></li> <li>Cases who were transferred to an EVT hospital in <b>List of EVT Hospitals in Ontario</b> <ul style="list-style-type: none"> <li>NACRS records with registration time at EVT hospital within 24 hours of registration time at DSC hospital</li> <li>DAD records with admission time at EVT hospital within 24 hours of registration time at DSC hospital</li> </ul> </li> </ul>
<b>Numerator</b>	Number of ischemic stroke cases who received an EVT
<b>Calculation</b>	$\frac{\text{Number of cases who received an EVT}}{\text{Number of ischemic stroke cases transferred to an EVT hospital}}$
<b>Unit of Analysis</b>	Transferred cases
<b>Adjustment</b>	N/A
<b>Reporting Level(s)</b>	Province, and EVT Site
<b>Target/Benchmark</b>	N/A
<b>Interpretation</b>	
<b>Limitations</b>	There is a small possibility that some patients were discharged home from a DSC/thrombolysis hospital and admitted themselves into an EVT hospital within 1 day.
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Reported only for FY2017/18 and after</li> <li>Ischemic stroke diagnosis criteria is applied only for the ED record at the DSC/tPA hospital. Some patients may not have a record with an ischemic stroke diagnosis at the receiving EVT hospital.</li> </ul>

SR2-4: Successful Reperfusion Rate for Patients that Received EVT

<b>Indicator Definition</b>	Percentage of EVT patients with a thrombolysis in cerebral infarction score (TICI score) of 2b or 3 documented at the conclusion of the EVT procedure
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>National Ambulatory Care Reporting System (NACRS)</li> </ul>
<b>Denominator</b>	<p>Number of ischemic stroke cases who had an EVT procedure (EVT cohort)</p> <p><b>Include:</b></p> <ul style="list-style-type: none"> <li>Special project 440 filled</li> </ul> <p><b>Exclude:</b></p> <ul style="list-style-type: none"> <li>Special project 440 not filled</li> </ul>
<b>Numerator</b>	<p>Number of EVT cases with a Thrombolysis in cerebral infarction (TICI) score of 2B (complete filling of all of the expected vascular territory is visualized but the filling is slower than normal) or 3 (complete perfusion):</p> <ul style="list-style-type: none"> <li>Special project 440 Field 23 = 'Y'</li> </ul>
<b>Calculation</b>	$\frac{\text{Number of EVT cases successfully reperfused}}{\text{Number of EVT cases had SP440 filled}}$
<b>Unit of Analysis</b>	EVT case
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, and EVT Site
<b>Target/Benchmark</b>	N/A
<b>Interpretation</b>	A higher value is desired
<b>Limitations</b>	
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Reported only for FY2017/18 and after</li> <li>Special project 440 data were entered retrospectively for FY2017/18. As THP did not enter data regarding reperfusion for that fiscal year, it was excluded from the indicator for that fiscal year.</li> </ul>

SR2-5: 30-Day Mortality of Patients that Received EVT

*New as of February 2026: the methodology for this indicator has been updated. Please refer to the latest version of the tech specs for the updated methodology.*

SR2-6: Median Days at Home in the First 90 days Following EVT

<p><b>Indicator Definition</b></p>	<p>The number of days EVT patients spent alive and outside of a health institution (hospital, inpatient rehab and/or LTC/CCC facility) in the first 90 days after the EVT hospitalization</p>
<p><b>Data Source(s)</b></p>	<ul style="list-style-type: none"> <li>• Discharge Abstract Database (DAD)</li> <li>• National Ambulatory Care Reporting System (NACRS)</li> <li>• Registered Persons Database (RPDB)</li> <li>• National Rehabilitation Reporting System (NRS)</li> <li>• Continuing Care Reporting System (CCRS)             <ul style="list-style-type: none"> <li>○ Long Term Care (LTC)</li> <li>○ Continuing Complex Care (CCC)</li> </ul> </li> </ul>
<p><b>Cohort</b></p>	<p>Ischemic stroke cases who had an EVT procedure (EVT cohort)</p> <p><b>Exclude:</b></p> <ul style="list-style-type: none"> <li>• Cases who were admitted to an LTC or CCC immediately prior (at baseline) to their EVT procedure</li> <li>• Cases who had <b>any</b> DAD record for the EVT procedure or within the subsequent 90 days with any of the following discharge disposition:             <ul style="list-style-type: none"> <li>○ '06' = sign-out (left against medical advice or absent without leave) (FY2017/18)</li> <li>○ '12' = did not return from a pass (FY2017/18)</li> <li>○ '61' = absent without leave (FY2018/19 and after)</li> <li>○ '62' = left against medical advice (FY2018/19 and after)</li> <li>○ '65' = did not return from a pass (FY2018/19 and after)</li> </ul> </li> </ul>
<p><b>Calculation</b></p>	<p>Number of days not institutionalized in the first 90 days after the EVT procedure, defined as:</p> <p style="text-align: center;"><b>Home Time</b> = (Maximum Home Time) – (Non-Home Time)</p> <p>Non-Home (NH) time is the sum (total) of the following up to the maximum home time cut-off date:</p> <ul style="list-style-type: none"> <li>• Length of stay until discharge for EVT procedure (DAD)</li> <li>• Length of stay for inpatient re-admissions following discharge for EVT procedure (DAD)</li> <li>• NACRS for admissions with at least 1 overnight stay</li> <li>• Length of stay in a long-term care (LTC) facility</li> <li>• Length of stay in a complex continuing care (CCC) facility</li> <li>• Length of stay in a rehabilitation (NRS) facility</li> </ul> <p>Maximum Home Time = Minimum of 90 days or days alive after EVT</p> <p>Methodology:</p> <ol style="list-style-type: none"> <li>1. Include records for admissions after the EVT procedure</li> <li>2. Include records for admissions within the maximum home time cut-off (noted above)</li> <li>3. Include records where the discharge date is at least one day after the admission date or empty</li> </ol>

	<ol style="list-style-type: none"> <li>4. Sort NH records, admission date and discharge date</li> <li>5. Append NH records from all sources, setting by the sorted variables</li> <li>6. Using the lag function, check if patients have NH time overlapping in multiple facilities</li> <li>7. Count overlapping NH times only once</li> </ol> <p>Hypothetical example 1</p> <table border="1"> <thead> <tr> <th>HCN</th> <th>EVT Date</th> <th>NH Adm.</th> <th>NH Dis.</th> <th>NH Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>2017-05-13</td> <td>2017-05-14</td> <td>2017-07-31</td> <td>78</td> </tr> <tr> <td>1</td> <td>2017-05-13</td> <td>2017-07-24</td> <td>2017-08-07</td> <td>7</td> </tr> </tbody> </table> <p>Hypothetical example 2</p> <table border="1"> <thead> <tr> <th>HCN</th> <th>EVT Date</th> <th>NH Adm.</th> <th>NH Dis.</th> <th>NH Time</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>2017-05-13</td> <td>2017-05-14</td> <td>2017-07-31</td> <td>78</td> </tr> <tr> <td>2</td> <td>2017-05-13</td> <td>2017-07-24</td> <td>2017-07-25</td> <td>0</td> </tr> </tbody> </table>	HCN	EVT Date	NH Adm.	NH Dis.	NH Time	1	2017-05-13	2017-05-14	2017-07-31	78	1	2017-05-13	2017-07-24	2017-08-07	7	HCN	EVT Date	NH Adm.	NH Dis.	NH Time	2	2017-05-13	2017-05-14	2017-07-31	78	2	2017-05-13	2017-07-24	2017-07-25	0
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<b>Adjustment</b>	No																														
<b>Unit of Analysis</b>	Day per EVT case																														
<b>Reporting Level(s)</b>	Province, and EVT Site <ul style="list-style-type: none"> <li>○ Including and excluding in-hospital strokes</li> </ul>																														
<b>Target/Benchmark</b>	N/A																														
<b>Interpretation</b>	A higher value is desired																														
<b>Limitations</b>	<ul style="list-style-type: none"> <li>• EVT cases require at least 90 days of follow-up following their EVT. Thus, calculation of indicator 6 will be delayed by one biannual reporting cycle (6 months).</li> <li>• Because acute care (DAD) data is based on discharge date, re-admissions into acute care with a length of stay greater than two quarters will not be captured.</li> </ul>																														
<b>Other Notes</b>	Reported only for FY2017/18 and after																														

## Chapter 3: Acute Care Access and Outcomes for Stroke and TIA

### SR3-1: Designated Stroke Unit Rate for Stroke/TIA Acute Patients

*Note well: the methodology for this indicator will be updated in FY 2026/27. The methodology described below will be used for reporting until then.*

<b>Indicator Definition</b>	Proportion of stroke patients treated in a designated stroke unit (DSU) among those admitted into an acute care hospital
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>Registered Persons Database (RPDB)</li> </ul>
<b>Denominator</b>	Number of patients in the acute inpatient stroke cohort excluding patients with missing special project 340 information
<b>Numerator</b>	<p>Number of stroke patients who were treated in a DSU at any time at admitting acute hospital</p> <ul style="list-style-type: none"> <li>Among the 25 special project number variables in DAD, identify the variable containing '340'</li> <li>Using the corresponding special project field variable, a value of the second character = 'Y'</li> </ul> <p>For a list of DSUs, see Appendix for <b>List of Stroke Hospitals in Ontario</b>.</p>
<b>Calculation</b>	$\frac{\text{Number of patients treated in a designated stroke unit}}{\text{Number of patients in acute inpatient stroke cohort}}$
<b>Unit of Analysis</b>	Patients (Stroke Acute Admissions)
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>This does not consider if patients were transferred to and treated in the DSU of another acute hospital</li> <li>This indicator is unadjusted for the duration and intensity of stroke unit care.</li> <li>The DAD (project 340) stroke unit variable in the 2012/13 data was compared to the Ontario Stroke Audit (OSA) 2012 stroke unit variable and their agreement calculated. Agreement was &gt; 85% for all hospital types except Regional Stroke Centres where agreement between the DAD and the OSA on whether stroke unit care was provided was 82%.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This indicator leverages the <a href="#">Ontario stroke unit definition</a>. The Stroke Report uses year-specific hospital DSU status.</li> </ul>

SR3-2: ALC Proportion of Total Inpatient Days in Acute Care for Stroke/TIA Patients

<b>Indicator Definition</b>	Proportion of days in alternative level care (ALC) relative to the total length of stay (LOS) among stroke/TIA patients admitted into an acute care hospital
<b>Data Source(s)</b>	Discharge Abstract Database (DAD)
<b>Cohort</b>	Patients in the acute inpatient stroke cohort
<p>The diagram illustrates a patient's stay timeline. It starts with a teal dot labeled 'Index Admission'. A horizontal line represents the stay. A teal arrow labeled 'Total LOS' spans from the start to a teal dot labeled 'Acute Discharge'. A purple dot labeled 'Ready for Discharge' is on the line. A purple arrow labeled 'ALC LOS' spans from the 'Ready for Discharge' dot to the 'Acute Discharge' dot.</p>	
<p><b>Total LOS</b> = Acute discharge – Admission into acute care  <b>ALC LOS</b> = ALC days from index acute hospital</p>	
<b>Denominator</b>	Sum of total LOS days per reporting level
<b>Numerator</b>	Sum of ALC LOS days per reporting level
<b>Calculation</b>	$\frac{\text{Sum of ALC LOS days}}{\text{Sum of total LOS days}}$ <p>95% confidence intervals were based on bootstrap sampling with 1000 replicates.</p>
<b>Unit of Analysis</b>	Days
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher proportion of ALC days relative to total length of stay could be interpreted as lack of access to post-stroke care including rehabilitation and homecare services. ALC days are frequently encountered for patients that require long-term care.
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>• Only the first stroke or TIA event a patient had in the fiscal year is included.</li> <li>• For patients who were transferred to another acute hospital, this indicator does not consider the stay at subsequent hospitals.</li> <li>• ALC days is not a mandatory data element in DAD and therefore may underreport days spent waiting for alternate care.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• A patient is designated Alternate Level of Care (ALC) by a physician or his/her delegate when the patient is occupying a bed in a hospital and does not require the intensity of resources/services provided in the current care setting (acute, complex continuing care, mental health or rehabilitation). The ALC wait period starts at the time of designation and ends at the time of discharge/transfer to a discharge destination (or when the patient's needs or condition changes and the ALC designation no longer applies). The standardized provincial ALC definition was implemented across all acute care facilities in Ontario on July 1, 2009.</li> </ul>

### SR3-3: Risk-Adjusted 30-Day All-Cause Mortality Rate for Stroke/TIA Patients

*New as of February 2026: the methodology for this indicator has been updated. Please refer to the latest version of the tech specs for the updated methodology.*

SR3-4: Risk-Adjusted 30-Day All-Cause Readmission Rate for Stroke/TIA Patients

<b>Indicator Definition</b>	Risk-adjusted 30-day all-cause readmission rate following discharge from acute care or the ED for stroke or transient ischemic attack (TIA), per 100 patients
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Discharge Abstract Database (DAD)</li> <li>National Ambulatory Care Reporting System (NACRS)</li> </ul>
<b>Denominator</b>	<p>Number of unique patients in the Stroke Cohort discharged alive, based on the following hierarchy:</p> <ol style="list-style-type: none"> <li>Patients in the post-acute sub-cohort</li> <li>Patients in the ED cohort meeting <b>all</b> the following criteria: Visit disposition code was not in the 'Death' category in <b>Appendix Table 2</b> and no stroke MRDx acute admission in the same fiscal year</li> </ol>
<b>Numerator</b>	<p>Patients re-admitted into acute care following the index event discharge</p> <ul style="list-style-type: none"> <li>For acute patients, discharge is from admitting hospital</li> <li>For ED patients, discharge is time patient left ED</li> </ul> <p><b>Inclusions:</b></p> <ul style="list-style-type: none"> <li>Readmission to hospital less than or equal to 30 days from discharge of index event</li> </ul> <p><b>Exclusions:</b></p> <ul style="list-style-type: none"> <li>Transfers to another acute hospital related to the index admission</li> <li>Elective re-admissions (Admit category = 'L')</li> <li>Re-admissions within 24 hours of discharge</li> </ul>
<b>Calculation</b>	<p><b>Crude (unadjusted) rate =</b>  <math display="block">\frac{\text{Number of patients readmitted within 90 days of discharge}}{\text{Number of stroke patients discharged alive}}</math></p> <p><b>Model-based risk-adjusted rate (indirect standardization) =</b>  <math display="block">(\text{Crude Rate/Expected Rate}) * \text{Provincial Crude Rate}</math></p>
<b>Unit of Analysis</b>	Patients (Stroke ED/Acute Admissions)
<b>Adjustment</b>	Age, Sex and Stroke Type
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index ED/Acute Site
<b>Target/Benchmark</b>	
<b>Interpretation</b>	<ul style="list-style-type: none"> <li>A lower rate is desired.</li> <li>The risk-adjusted readmission rate is one measure of the effectiveness of hospital care and discharge planning.</li> </ul>
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Each index patient requires at least 30 days of follow-up data from time of discharge</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Not all re-admissions are avoidable, and this indicator does not capture which re-admissions were avoidable and the underlying reasons. The indicator captures hospital re-admission only and does not capture return visits to the emergency department.</li> </ul>

SR3-5: Standardized Rate of Discharge to CCC/LTC for Stroke/TIA Patients

<b>Indicator Definition</b>	Proportion of acute stroke/TIA patients discharged from the index (first) acute care hospital to long-term care (LTC) or complex continuing care (CCC) (excluding patients admitted to acute care from chronic hospitals, nursing homes, and homes for the aged)
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Continuing Care Reporting System (CCRS)</li> <li>Discharge Abstract Database (DAD)</li> </ul>
<b>Denominator</b>	<p>Number of patients discharged alive from acute care, excluding patients admitted from chronic hospitals, nursing homes and homes for the aged which corresponds to the following Institution from Type codes:</p> <ul style="list-style-type: none"> <li>'03' = CCC</li> <li>'04' = LTC</li> <li>'09' = Inpatient palliative care facility</li> </ul>
<b>Numerator</b>	<p>Number of stroke patients meeting all of the following criteria:</p> <ul style="list-style-type: none"> <li>Acute discharge disposition indicates facility transfer <ul style="list-style-type: none"> <li>'01', '02', '03' for FY2017/18 and earlier</li> <li>'10', '30', '40' for FY2018/19</li> </ul> </li> <li>Acute discharge Institution to Type is a chronic facility code: <ul style="list-style-type: none"> <li>'03' = CCC</li> <li>'04' = LTC</li> <li>'09' = Inpatient palliative care facility</li> </ul> </li> </ul> <p>See <b>Appendix Table 2</b> for descriptions of discharge disposition codes</p>
<b>Calculation</b>	$\frac{\text{Number of patients discharged to CCC/LTC}}{\text{Number of acute stroke patients discharged alive}}$
<b>Unit of Analysis</b>	Patient (Stroke Acute Admissions)
<b>Adjustment</b>	Age and Stroke Type
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index Acute Site
<b>Target/Benchmark</b>	N/A
<b>Interpretation</b>	Patients admitted from the community with stroke or TIA and discharged to long-term or complex continuing care may indicate a shortage of rehabilitation options at time of discharge
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Patients discharged home and waiting for admission to LTC are not included.</li> <li>Patients transferred to another acute care hospital and then admitted to a CCC or LTC facility are not included.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This is a population-based indicator. The patient's postal code is used to report Regional performance.</li> </ul>

SR3-6: Standardized Rate of Admission to Long-term Care One-Year Post-discharge

<b>Indicator Definition</b>	Proportion of stroke/TIA patients admitted into a long-term care facility within one year (365 days) following discharge from acute care
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>Continuing Care Reporting System (CCRS)</li> </ul>
<b>Denominator</b>	<p>Number of patients discharged alive from acute care, excluding patients admitted from chronic hospitals, nursing homes and homes for the aged which corresponds to the following Institution from Type codes:</p> <ul style="list-style-type: none"> <li>'3' = CCC</li> <li>'4' = LTC</li> <li>'9' = Inpatient palliative care facility</li> </ul>
<b>Numerator</b>	<p>Number of stroke patients admitted into a long-term care facility within one year (365 days) following the <b>index</b> discharge from acute care</p> <ul style="list-style-type: none"> <li>0 &lt;= (LTC admission date – index acute discharge) &lt;= 365 days</li> <li>CCRS Sector = 'LTC'</li> </ul>
<b>Calculation</b>	$\frac{\text{Number of patients admitted into LTC within 1 year}}{\text{Number of acute stroke patients discharged alive}}$
<b>Unit of Analysis</b>	Patient (Stroke Acute Admissions)
<b>Adjustment</b>	Age and Stroke Type
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index Acute Site
<b>Target/Benchmark</b>	N/A
<b>Interpretation</b>	A lower value is desired
<b>Limitation(s)</b>	Patient who are wait-listed for long-term care are not captured in the numerator.
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This is a population-based indicator. The patient's postal code is used to report Regional performance.</li> <li>Patients first discharged home from acute care and then admitted to LTC within a year are included.</li> <li>Patients transferred to another acute care hospital and then admitted to a LTC facility are included.</li> <li>Due to the 1-year follow-up requirement, the last reporting fiscal year includes only acute discharges from Q1 &amp; Q2 (April – September).</li> </ul>

SR3-7: Standardized Days at Home in the 90-days Following Stroke or TIA Admission

<p><b>Indicator Definition</b></p>	<p>The number of days stroke/TIA patients spent alive and outside of a health institution (hospital, inpatient rehab and/or skilled nursing facility) in the first 90 days after admission into acute care</p>
<p><b>Data Source(s)</b></p>	<ul style="list-style-type: none"> <li>• Discharge Abstract Database (DAD)</li> <li>• National Ambulatory Care Reporting System (NACRS)</li> <li>• Registered Persons Database (RPDB)</li> <li>• National Rehabilitation Reporting System (NRS)</li> <li>• Continuing Care Reporting System (CCRS)             <ul style="list-style-type: none"> <li>○ Long Term Care (LTC)</li> <li>○ Continuing Complex Care (CCC)</li> </ul> </li> </ul>
<p><b>Cohort</b></p>	<p>Patients in the acute inpatient stroke cohort, excluding:</p> <ul style="list-style-type: none"> <li>• Patients from chronic hospitals, nursing homes and homes for the aged which corresponds to the following Institution from Type codes:             <ul style="list-style-type: none"> <li>○ '03' = CCC</li> <li>○ '04' = LTC</li> <li>○ '09' = Inpatient palliative care facility</li> </ul> </li> <li>• Patients who have death dates erroneously recorded as being before acute care admission</li> </ul>
<p><b>Calculation</b></p>	<p>Number of days not institutionalized in the first 90 days after the index admission into an acute hospital, defined as:</p> <p style="text-align: center;"><b>Home-time</b> = (Maximum Home-time) – (Non-Home Time)</p> <p>Non-Home (NH) time is the sum (total) of the following up to the maximum home time cut-off date:</p> <ul style="list-style-type: none"> <li>• Length of stay until discharge for index acute admission (DAD)</li> <li>• Length of stay for inpatient re-admissions (DAD)</li> <li>• NACRS for admissions with at least 1 overnight stay</li> <li>• Length of stay in a long-term care (LTC) facility</li> <li>• Length of stay in a complex continuing care (CCC) facility</li> <li>• Length of stay in a rehabilitation (NRS) facility</li> </ul> <p>Maximum Home-time = Minimum of 90 days or days alive after admission</p> <p>Methodology:</p> <ol style="list-style-type: none"> <li>8. Include records for admissions after index acute admission and within the maximum home time cut-off (noted above)</li> <li>9. Include records where the discharge date is at least one day after the admission date or empty</li> <li>10. Sort by admission date and discharge date</li> <li>11. Append non-home records from all sources, by sorted variables</li> <li>12. Using the lag function, check for overlapping institution time</li> <li>13. Count overlapping institution time only once</li> </ol> <p>Hypothetical example 1</p>

	HCN	Acute Admission	Non-Home Admission	Non-Home Discharge	Non-Home Time
	1	2017-05-13	2017-05-14	2017-07-31	78
	1	2017-05-13	2017-07-24	2017-08-07	7
	Hypothetical example 2				
	HCN	Acute Admission	Non-Home Admission	Non-Home Discharge	Non-Home Time
	2	2017-05-13	2017-05-14	2017-07-31	78
	2	2017-05-13	2017-07-24	2017-07-25	0
	95% confidence intervals were based on bootstrap sampling with 1000 replicates.				
<b>Adjustment</b>	Stroke type and patient age				
<b>Unit of Analysis</b>	Days per stroke patient				
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index Acute Site				
<b>Target/Benchmark</b>	N/A				
<b>Interpretation</b>	A higher value is desired				
<b>Limitations</b>	<ul style="list-style-type: none"> <li>Patients require at least 90 days (1 quarter) of follow-up following their admission into acute care. Post-acute activity may span multiple quarters.</li> </ul>				
<b>Other Notes</b>					

## Chapter 4: Post-acute Stroke Rehabilitation Access and Timeliness

### SR4-1: Proportion of Stroke Patients who Received Post-acute Rehabilitation

<b>Indicator Definition</b>	<p>Proportion of stroke patients discharged alive from acute care who were admitted into IP rehab and/or received at least 3 HB rehab visits, reported as 3 sub-indicators:</p> <ul style="list-style-type: none"> <li>• SR4-1.1: Proportion of Stroke Patients who Received Post-acute Rehabilitation</li> <li>• SR4-1.2: Proportion of Stroke Patients who Received Inpatient Rehabilitation</li> <li>• SR4-1.3: Proportion of Stroke Patients who Received Home-based Rehabilitation</li> </ul>
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>• National Rehabilitation Reporting System (NRS)</li> <li>• Home Care Database (HCD), Client Health and Related Information System (CHRIS)</li> </ul>
<b>Denominator</b>	<p>Number of stroke patients who are eligible for rehab meeting all of the following criteria:</p> <ul style="list-style-type: none"> <li>• Discharged alive from the final acute care hospital</li> <li>• Did not self-sign-out from the final acute care hospital</li> <li>• Stroke type is ischemic or hemorrhagic or unknown</li> </ul>
<b>Numerator</b>	<p>Subset of the denominator who satisfied any of the following criteria:</p> <ul style="list-style-type: none"> <li>• Admitted into IP rehab within 1 day following final discharge from acute care</li> <li>• Received at least 3 HB rehab visits for the following services: <ul style="list-style-type: none"> <li>○ 5 = Physiotherapy (PT)</li> <li>○ 6 = Occupational therapy (OT)</li> <li>○ 7 = Speech language therapy (SLP)</li> <li>○ 8 = Social work (SW)</li> </ul> </li> </ul>
<b>Calculation</b>	<p><b>Proportion Receiving IP and/or Home-Based Rehab:</b></p> $\frac{\text{Number of patients receiving IP or HB rehab}}{\text{Number of rehab – eligible stroke patients}}$ <p>Proportion receiving either modality separately computed analogously.</p> <p>Note: Patients can appear in multiple rehab care settings, but they are included only once in the numerator for each calculation.</p>
<b>Unit of Analysis</b>	Patient (Stroke Acute Admissions)
<b>Adjustment</b>	Stroke type and severity
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient sub-Region, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher value is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>• Stroke OP rehab data are currently not available.</li> <li>• Post-acute rehab activity may occur in multiple fiscal years.</li> </ul>

<b>Other Notes</b>	<ul style="list-style-type: none"><li>• This indicator is an update to the old Stroke Report Card indicator #11 (admitted into IP rehab). It now also reports the proportion who received HB rehab, and proportion who received <b>any</b> post-acute rehab.</li><li>• Due to missing outpatient rehab data, sub-indicator SR4-1.1 is on pause as decided by Stroke Evaluation Quality Committee</li></ul>
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SR4-2: Median Time to First Post-Acute IP and HB Rehabilitation

<b>Indicator Definition</b>	There are two-time measurements for this indicator. For patients discharged to IP rehab, Time 1 is the number of days from acute admission to IP rehab admission. Among those who were <b>not</b> admitted IP rehab, Time 2 is the number of days from the final acute discharge to the first HB rehab visit.
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>National Rehabilitation Reporting System (NRS)</li> <li>Home Care Database (HCD), Client Health and Related Information System (CHRIS)</li> </ul>
<b>Cohort</b>	<p>Stroke patients in the Rehabilitation cohort</p> <ul style="list-style-type: none"> <li>Admitted into IP rehab within 1 day following the final discharge from acute care</li> <li>Received at least 3 HB rehab visits</li> </ul>
<p>The diagram shows a horizontal timeline with three key events marked by colored dots: a teal dot for 'Acute Admission', a teal dot for 'Acute Discharge / IP Rehab Admission', and a yellow dot for 'First HB rehab post-acute discharge'. A teal arrow labeled 'Time 1' spans from the first teal dot to the second teal dot. A yellow arrow labeled 'Time 2' spans from the second teal dot to the yellow dot.</p>	
<b>Calculation</b>	<p>For patients admitted into IP rehab:  <b>Time 1</b> = (IP Rehab Admission) – (Acute Care Admission)</p> <p>For patients who received HB Rehab, and not admitted into IP rehab:  <b>Time 2</b> = (First HB Rehab) – (Acute Care Discharge)</p>
<b>Unit of Analysis</b>	Days
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and Index Acute Site
<b>Target/Benchmark</b>	<ul style="list-style-type: none"> <li>Time 1 - Ischemic Target: 6 days</li> <li>Time 1 - Hemorrhagic Target: 8 days</li> <li>Time 2 Target: 48 hours (2 days)</li> </ul> <p><i>Source: Health Quality Ontario; Ministry of Health and Long-Term Care. Quality-based procedures: clinical handbook for stroke (acute and post-acute). Toronto: Health Quality Ontario; 2016 December.</i></p>
<b>Interpretation</b>	Individual patient factors may influence the time to post-acute rehabilitation.
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Stroke OP rehab data are currently not available.</li> <li>Post-acute rehab activity may occur in both the index and subsequent fiscal year. Due to insufficient follow-up IP rehab data, the last reporting fiscal year includes only acute discharges from Q1 &amp; Q2 (April – September).</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>This indicator is an update to the old Stroke Report Card indicator #13: Days from onset to IP rehab admission. It now reports on three different time measurements. The starting point is no longer onset as identified in NRS but is conditional on the time measurement.</li> <li>A consideration for future reporting is a third time measurement from IP rehab discharge to the first HB rehab visit.</li> </ul>

SR4-3: Best-practice Rehabilitation Setting within Target Time

<b>Indicator Definition</b>	Proportion of stroke patients who received post-acute rehab at the care setting and within recommended times as determined by stroke severity, according to current best practices
<b>Data Source(s)</b>	<ul style="list-style-type: none"> <li>National Rehabilitation Reporting System (NRS)</li> <li>Home Care Database (HCD), Client Health and Related Information System (CHRIS)</li> </ul>
<b>Denominator</b>	<p>Number of stroke patients who are eligible for rehab meeting all of the following criteria:</p> <ul style="list-style-type: none"> <li>Discharged alive from the final acute care hospital</li> <li>Did not self-sign-out from the final acute care hospital</li> <li>Stroke type is ischemic or hemorrhagic or unknown</li> <li>Stroke severity is not unknown</li> </ul>
<b>Numerator</b>	<ul style="list-style-type: none"> <li>Discharged to best-practice rehab care setting based on severity at acute care as identified in <b>Appendix Table 3</b></li> <li>Admitted to or received the first post-acute care rehab within the recommended time based on stroke severity as identified in <b>Appendix Table 3</b></li> </ul>
<b>Calculation</b>	$\frac{\text{Number of patients discharged to best – practice rehab care setting within target time}}{\text{Number of rehab – eligible stroke patients}}$
<b>Unit of Analysis</b>	Patient (Stroke Acute Admissions)
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health REGION, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>Due to the non-availability of outpatient stroke rehab data, this indicator is currently on pause, as decided by Stroke Evaluation Quality Committee.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li><i>The UDSMR AlphaFIM Instrument guide asserts: “The AlphaFIM® instrument and associated algorithms should not be used as the sole source of information upon which admission and discharge decisions are made but should supplement rather than replace good clinical care and medical judgement.” Thus, we do not expect 100% compliance to the best-practice post-acute rehab discharge destination.</i></li> </ul>

SR4-4: Standardized Active Length of Stay in Inpatient Rehabilitation

<b>Indicator Definition</b>	The number of days at inpatient rehabilitation excluding non-active length of stay (LOS) and all service interruptions
<b>Data Source(s)</b>	National Rehabilitation Reporting System (NRS)
<b>Cohort</b>	Patients in IP rehab cohort which can include any of the following: <ul style="list-style-type: none"> <li>Admitted into IP rehab within 1 day following final acute discharge</li> <li>Admitted from non-acute facility such as CCC</li> </ul>
<b>Calculation</b>	<p>The stay at IP rehab may not be continuous at a single facility. The active LOS excludes from the total LOS the sum of the first three interruptions in stay and non-active days.</p> <p><b>IP Rehab Active LOS (Crude)</b></p> $= \text{Total LOS} - (\text{Non-Active LOS}) - \text{Interruptions}$ $= (\text{Discharge Date} - \text{Admission Date}) - (\text{Discharge Date} - \text{Ready for Discharge Date}) - \sum_{i=1 \text{ to } 3} (\text{End of Interruption} - \text{Start of Interruption})_i$
<b>Unit of Analysis</b>	Days
<b>Adjustment</b>	<ul style="list-style-type: none"> <li>Indirect adjustment using RPG FIM motor and cognitive score</li> <li>95% confidence intervals were based on bootstrap sampling with 1000 replicates.</li> </ul>
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and IP Rehab Site
<b>Target/Benchmark</b>	No target is provided as this indicator is adjusted for RPG FIM motor and cognitive score, and individual targets of each RPG is no longer applicable.
<b>Interpretation</b>	Patient's length of stay in post-acute inpatient rehabilitation is based on patient's needs.
<b>Limitation(s)</b>	Indicator currently is not reported in the Stroke Report and will be replaced in the future with another LOS indicator. Although there are targets LOS, there is ambiguity regarding whether they are maximum or minimum thresholds.
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Reporting period is based on fiscal year of IP rehab discharge date.</li> <li>Up to five service interruptions are reportable in NRS. As the majority of NRS records reported patients as having no service interruption, there was a negligible difference in active LOS.</li> </ul>

SR4-5: Median Minutes Per Day of Direct Therapy in Inpatient Rehabilitation

<b>Indicator Definition</b>	The number of minutes per day of direct therapy received by stroke patients during their active inpatient rehab stay
<b>Data Source(s)</b>	National Rehabilitation Reporting System (NRS)
<b>Cohort</b>	<p>Patients in IP rehab cohort which can include any of the following:</p> <ul style="list-style-type: none"> <li>Admitted into IP rehab within 1 day following the final discharge from acute care</li> <li>Admitted from non-acute facility such as CCC</li> </ul>
<b>Calculation</b>	$\text{Therapist Activity} = \text{Physiotherapy (PT) minutes} + \text{Occupational Therapy (OT) minutes} + \text{Speech – Language Pathology (SLP) minutes}$ $\text{Therapy Assistant (TA) Activity} = \text{PT} + \text{OT} + \text{CD Assistant minutes}$ $\text{Total Reported Therapy (TRT)} = \text{Therapist Activity} + \text{TA Activity}$ $\text{TA Cutoff} = (\text{TRT}) \times 0.33$ $\text{Pro – rated IP Rehab} = \frac{\text{minimum (TRT, Therapist Activity + TA Cutoff)}}{\text{TRT}}$ <p><b>Patient-level Rehab Intensity:</b></p> $\text{IP Rehab Intensity} = \frac{\text{Pro – rated IP Rehab}}{\text{IP Rehab Active LOS}}$ <p>Note 1: Rehab time or activity values that contain '999' or '9999' or '99999' are ignored in the above</p> <p>Note 2: Indicator is median intensity</p>
<b>Unit of Analysis</b>	Minutes per Day, per Patient
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Facility Ontario Health Region, and IP Rehab Site
<b>Target/Benchmark</b>	Target: 180 minutes per day (Health Quality Ontario, Ministry of Health and Long-Term Care. <i>Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Postacute)</i> . Toronto, ON: HQO; December 2016. Accessed April 15, 2019 at <a href="http://health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_stroke.pdf">http://health.gov.on.ca/en/pro/programs/ecfa/docs/qbp_stroke.pdf</a> )
<b>Interpretation</b>	A higher rate is desired
<b>Limitation(s)</b>	IP rehab therapy minutes only include direct (face-to-face) rehab time and excludes group sessions.
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>Reporting period is based on fiscal year of IP rehab discharge date. Therapy minutes data are available for FY2015/16 and after.</li> </ul>

SR4-6: Median Duration of Home-based Rehab (Weeks)

<b>Indicator Definition</b>	The number of weeks of home-based (HB) rehab following discharge from acute care or inpatient (IP) rehab, up to a maximum of 180 days. The first HB rehab visit must start within 60 days of discharge.
<b>Data Source(s)</b>	Home Care Database (HCD), Client Health and Related Information System (CHRIS)
<b>Cohort</b>	Stroke patients who received at least 3 HB rehab visits following discharge from acute care or IP rehab
<b>Calculation</b>	<p><b>HB Rehab Duration =</b>            (Last visit within 180 days following first visit – Date of first visit within 60 days following discharge) / 7</p> <p>Included HB rehab services for stroke:</p> <ul style="list-style-type: none"> <li>○ 5 = Physiotherapy (PT)</li> <li>○ 6 = Occupational therapy (OT)</li> <li>○ 7 = Speech language therapy (SLP)</li> <li>○ 8 = Social work (SW)</li> </ul> <p>Indicator is median</p>
<b>Unit of Analysis</b>	Weeks
<b>Adjustment</b>	No
<b>Reporting Level(s)</b>	Province, Patient Ontario Health Region, Patient Subregion, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	Longer duration of rehab-associated home care visits implies greater intensity of services directed to recovery from stroke.
<b>Limitation(s)</b>	<ul style="list-style-type: none"> <li>• This indicator requires up to 240 days of follow-up in the home care data, so post-acute rehab activity may occur in both the index and subsequent fiscal year.</li> <li>• Regions providing HB rehab therapy where there are planned or expected gaps between therapy visits will have a longer duration.</li> </ul>
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• HCD records indicate that some visits occurred while a patient was still admitted in an IP rehab facility. These are not considered HB rehab visits and are excluded from this indicator.</li> </ul>

SR4-7: Median Number of Home-based Rehab Visits

<b>Indicator definition</b>	The number of home-based (HB) rehab visits among stroke patients who received at least 3 HB rehab visits following discharge from acute care or inpatient rehab
<b>Data source(s)</b>	Home Care Database (HCD), Client Health and Related Information System (CHRIS)
<b>Cohort</b>	Stroke patients who received at least 3 HB rehab visits following discharge from acute care or IP rehab
<b>Calculation</b>	The total number of HB rehab visits among the following services for stroke: <ul style="list-style-type: none"> <li>○ 5 = Physiotherapy (PT)</li> <li>○ 6 = Occupational therapy (OT)</li> <li>○ 7 = Speech language pathology (SLP)</li> <li>○ 8 = Social work (SW)</li> </ul> <p>Indicator is median</p>
<b>Unit of analysis</b>	Visits
<b>Adjustment</b>	No
<b>Reporting level(s)</b>	Province, Patient Ontario Health Region, Patient Subregion, and Index Acute Site
<b>Target/Benchmark</b>	Benchmarks are provided
<b>Interpretation</b>	More rehab-associated home care visits imply greater intensity of services directed to recovery from stroke.
<b>Limitation(s)</b>	This indicator requires up to 240 days of follow-up in the home care data after discharge, so post-acute rehab activity may occur in both the index and subsequent fiscal year. Thus, the last reporting fiscal year includes only acute discharges from Q1 & Q2 (April – September).
<b>Other Notes</b>	<ul style="list-style-type: none"> <li>• A new inclusion criterion of a minimum 3 HB rehab visits was implemented to exclude patients who most likely received only assessment visits and not actual rehab visits. This criterion will lead to a reduction in the number of patients as receiving HB rehab, but an increase in the mean number of visits.</li> <li>• HCD records indicate that some visits occurred while a patient was still admitted in an IP rehab facility. These are not considered HB rehab visits and are excluded from this indicator.</li> </ul>

## Chapter 5: Reporting Considerations

### Benchmarks

Where applicable, the bottom and top performer values were provided using the ABC methodology. The top performers were identified as follows:

1. Care providers (hospitals or sub-Regions) were ranked in order of performance on the indicator.
2. Beginning with the highest-performing care provider, the providers were added until at least 20% of the total number of patients were represented (in the denominator). It is important to note that some of the indicators, low values are desired.
3. The benchmark is the indicator result of interest for the subset of eligible patients.

To ensure that high-performing care providers with low numbers of patients did not unduly influence the benchmark rates, hospitals or sub-Regions that had a cohort size (denominator) of less than 30 were not included in the benchmark calculations. A similar process was implemented to identify the bottom performance based on the lowest performing sites/Regions that accounted for 20% of the indicator cohort of interest.

### Data Suppression

Data suppression is the masking of results as a requirement of Ontario's Personal Health Information Protection Act (PHIPA). There are three main scenarios where data suppression will be applied within the Stroke Report:

1. Non-reportable (NR): Volumes (counts) are between 1-5 ("small cell") in the denominator (cohort) or numerator of the original unmasked results. Masked results will appear with NR as a prefix, and ranges of possible values are provided where appropriate.
2. Complementary Suppression (CS): This is applicable only to proportion/rate type indicators where the difference between the denominator and the numerator is between 1-5. In other words, the absence of the event/outcome is a "small cell." Masked results will appear with a 'CS' prefix and ranges of possible values in the numerator and observed rate.
3. Supplementary Suppression (SS): This is applicable only when multiple levels of reporting are provided, where one level is a subset of the other. For example, the sum of all hospital/subregion results will equal the Ontario Health REGION result. For each year, if there is only one site/subregion/OH REGION with data suppression (or multiple results have NR or CS suppression, but the sum is still a "small cell"), then the lowest value greater than 5 will have results appear with an 'SS' prefix and ranges of possible values. (This is based on the numerator for proportion-rate type indicators and denominator for median-type indicators.

## Performance Status

For applicable indicators, performance status (significant testing) was provided relative to Ontario's performance. Status can be "High," "Low" or "Inlier" and is based on the following algorithm:

- **High:** Observed rate exceeds the upper 95% confidence limit of the expected rate
- **Inlier:** Observed rate is within the 95% confidence interval of the expected rate
- **Low:** Observed rate is less than the lower 95% confidence limit of the expected rate

For indicators where the Expected values are not provided, but the median or standardized values are provided, the following algorithm is applied:

- **High:** Ontario value < Ontario Health Region/site/subregion's lower 95% confidence limit
- **Inlier:** Ontario value lies within the Ontario Health Region/site/subregion's 95% confidence interval
- **Low:** Ontario value > Ontario Health Region/site/subregion's upper 95% confidence limit

Additional considerations for performance status:

- Only provided for sites/subregions with at least 30 patients in the cohort (denominator)
- Based on actual results and not suppressed results
- Not provided for sites/Regions where the lower 95% confidence limit (CL) of the expected rate is 0
- Not relative to a target but may change in future stroke reporting

## Appendix

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## Table of Acronyms

Acronym	Description
ALC	Alternate Level of Care
CABG	Coronary Artery Bypass Grafting
CCC	Complex Continuing Care
CCI	Canadian Classification of Health Interventions
CCRS	Continuing Care Reporting System
CHRIS	Client Health and Related Information System
CIHI	Canadian Institute for Health Information
DAD	Discharge Abstract Database
DSC	Designated Stroke Centre
DSU	Designated Stroke Unit
DTN	Door-to-needle (tPA)
ED	Emergency Department
EVT	Endovascular Thrombectomy/Therapy
HB	Home-based (Rehab)
HCD	Home Care Database
HCN	Health Card Number
ICD-10CA	International Classification of Diseases – Version 10 (Canada)
IP Rehab	Inpatient Rehabilitation
LOS	Length of Stay
LTC	Long-term Care
MCC	Major Clinical Category
MIS	Management Information System
MRDx	Most Responsible Diagnosis
NACRS	National Ambulatory Care Reporting System
NRS	National Rehabilitation Reporting System
ODB	Ontario Drug Benefit
OHIP	Ontario Health Insurance Plan
OP Rehab	Outpatient Rehab
OT	Occupational therapy / Occupational therapist
PCI	Percutaneous Coronary Intervention (angioplasty with stent)
PT	Physiotherapy / Physiotherapist
PTN	Patient Token Number
QBP	Quality-based Procedures
RPDB	Registered Persons Database
RSC	Regional Stroke Centre
SLP	Speech-Language Pathology
SW	Social Work(er)
tPA	Tissue Plasminogen Activator

## List of EVT Hospitals in Ontario

Facility Name	Site Providing EVT	Facility Number	Institution Abbreviation	Institution AM Number	Institution AT Number	EVT Coverage Period (Fiscal)
Hamilton Health Sciences Corporation	General Site	942	HHSC	4231	1982	2017-2022
Health Sciences North	Laurentian	959	HSN	4063	4059	2020-2022
Kingston Health Sciences Centre	Kingston General	693	KHSC	4105	1100	2016-2017
Kingston Health Sciences Centre	Kingston General	693	KHSC	4832	4831	2018-2022
London Health Sciences Centre	University Hospital	936	LHSC	4310	3850	2017-2022
Sunnybrook Health Sciences Centre	Sunnybrook Health Sciences Centre	953	SHSC	4205	3936	2017-2022
The Ottawa Hospital	Civic Site	958	TOH	4079	4046	2017-2022
Thunder Bay Regional Health Sciences Centre	Thunder Bay Regional Health Sciences Centre	935	TBRHSC	4315	3853	2018-2022
Trillium Health Partners	Mississauga Site	975	THP	4756	4752	2017-2022
Unity Health Toronto	St. Michael's Hospital	852	UHT	3985	1444	2017-2017
Unity Health Toronto	St. Michael's Hospital	852	UHT	4864	4865	2018-2022
University Health Network	Toronto Western	947	UHN	4266	3910	2017-2022
Windsor Regional Hospital	Ouellette Campus	933	WRH	4774	4773	2017-2022

Note 1: Starting in FY2018/19, St. Michael's Hospital merged with St. Joseph and Providence to form Unity Health Toronto.

Note 2: Health Sciences North-Laurentian became an EVT site in FY2019/20 Q4. Operated 24/7 starting in 2021.

Note 3: Windsor Regional Hospital became an EVT site in 2020

Note 4: Kingston Health Sciences Centre was issued a new facility number in 2018.

### List of Stroke Hospitals in Ontario with RSC/DSC or Thrombolysis or DSU Status

Institution Name	Ambulatory (AM) Number	Acute (AT) Number	Facility Number	RSC or DSC	Thrombolysis Status	Stroke Unit Status During Report Period (Effective Date)
Alexandra Marine and General Hospital	4082	1206	663		Y	
Bluewater Health - Sarnia General Site	4109	4415	966	DSC	Y	Y
Brant Community Healthcare Sys - Brantford	4679	4675	970	DSC	Y	Y
Brightshores Health System - Owen Sound	4131	3944	955	DSC	Y	Y
Brockville General Hosp - Charles St Site	4186	1273	619		Y	Y
Chatham Kent Health Alliance - Chatham (Public General Hosp Society Of Chatham)	4238	1223	628	DSC	Y	Y
Chatham Kent Health Alliance - Chatham (FY2018/19)	4870	4871	981	DSC	Y	Y
Cornwall Community Hospital	4452	4451	967	DSC	Y	FY2021/22 Q3
Dryden Regional Health Centre	4248	2103	647		Y	
Grand River Hospital Corp - Waterloo Site	4107	3734	930	DSC	Y	Y
Guelph General Hospital	4044	1946	665		Y	Y
Halton Healthcare Services Corp – Oakville	4192	3926	950		Y	FY2016/17
Hamilton Health Sciences – General	4231	1982	942	RSC	Y	Y
Hawkesbury And District General Hospital	4268	1777	800		Y	
Health Sciences North - Laurentian	4063	4059	959	RSC	Y	FY2017/18
Hopital Montfort	4130	1661	753			FY2023/24
Humber River Hospital - Wilson (FY2015/16)	4802	4799	941			Y
Huron Perth Healthcare Alliance - Stratford General	7557	7558	983	DSC	Y	Y
Joseph Brant Hospital	4144	1160	718		Y	FY2019/20
Kingston Health Sciences Centre - General	4105	1100	693	RSC	Y	Y
Kingston Health Sciences Centre - General (FY2017/18)	4832	4831	978	RSC	Y	Y
Lake-Of-The-Woods District Hospital	4200	2110	826		Y	
Lakeridge Health - Ajax (Rouge Valley Health System)	4140	4014	954		Y	
Lakeridge Health - Ajax (FY2017/18)	4845	4844	952		Y	
Lakeridge Health - Oshawa	4171	3932	952	DSC	Y	Y

Institution Name	Ambulatory (AM) Number	Acute (AT) Number	Facility Number	RSC or DSC	Thrombolysis Status	Stroke Unit Status During Report Period (Effective Date)
London Health Sciences Centre - University	4310	3850	936	RSC	Y	Y
London Health Sciences Centre - Victoria	4247	4359	936	RSC	Y	
Mackenzie Health – Cortellucci Vaughan Hospital	5468	5469	701	DSC	Y	Y
Muskoka Algonquin Healthcare - Huntsville	4618	4616	968	DSC	Y	
Niagara Health System - Greater Niagara	3982	4213	962	DSC	Y	Y
Niagara Health System - St Catherine's Gen	4045	4224	962			FY2016/17 – FY2021/22
North Bay Regional Health Centre	4734	4730	974	DSC	Y	FY2016/17
Notre Dame Hospital (Hearst)	4169	2082	681		Y	
North York General Hospital	4233	1330	632			Y
Oak Valley Health - Markham Stouffville Hospital	4235	3587	905			FY2017/18
Orillia Soldiers' Memorial Hospital	4108	1853	745			FY2017/18
Pembroke Regional Hospital Inc.	4071	1804	763	DSC	Y	Y
Peterborough Regional Health Centre	4073	1768	771	DSC	Y	Y
Quinte Healthcare Corporation - Belleville	4097	3988	957	DSC	Y	Y
Riverside Health Care Fac - La Verendrye	4124	2150	900		Y	
Ross Memorial Hospital	4177	1893	707			Y
Royal Victoria Regional Health Centre	3987	1825	606	RSC	Y	FY2016/17
Sault Area Hospital - Sault Ste Marie	3972	4407	965	DSC	Y	FY2021/22 Q2
Scarborough Health Network - Birchmount	3984	4154	979			FY2020/21
Scarborough Health Network - Centenary (Rouge Valley Health System - Centenary)	4139	3943	951			Up to FY2016/17
Scarborough Health Network - Centenary (FY2017/18)	4837	4836	979			FY2017/18 Only
Scarborough Health Network - General	3975	4152	960			Up to FY2016/17
Scarborough Health Network - General (FY2017/18)	4839	4840	979			Up to FY2019/20
Sioux Lookout Meno-Ya-Win Health Centre	4137	4353	964		Y	
Southlake Regional Health Centre	4001	2038	736			Y

Institution Name	Ambulatory (AM) Number	Acute (AT) Number	Facility Number	RSC or DSC	Thrombolysis Status	Stroke Unit Status During Report Period (Effective Date)
St Thomas-Elgin General Hospital	4076	1059	793			FY2016/17
Sunnybrook Health Sciences Centre	4205	3936	953	RSC	Y	Y
Temiskaming Hospital	4264	2207	888		Y	
The Ottawa Hospital – Civic	4079	4046	958	RSC	Y	FY2016/17
The Ottawa Hospital – General	4085	4048	958		Y	
Thunder Bay Regional Health Sciences Centre	4315	3853	935	RSC	Y	Y
Timmins & District General Hospital	4123	3414	907	DSC	Y	FY2016/17
Toronto East Health Network - Michael Garron	4209	1302	858			FY2020/21
Trillium Health Partners - Credit Valley	4751	4747	975		Y	
Trillium Health Partners - Mississauga	4756	4752	975	RSC	Y	Y
Unity Health Toronto-St Joseph's Health Centre	4857	4858	980			Y
Unity Health Toronto-St. Michael's Hospital	3985	1444	852	RSC	Y	Y
Unity Health Toronto-St. Michael's Hospital (FY2018/19 and after)	4864	4865	980	RSC	Y	Y
University Health Network-Toronto Western	4266	3910	947	RSC	Y	Y
University Of Ottawa Heart Institute	4303	4164	961		Y	
Weeneebayko Area Health Authority – Moose Factory	4699	4698	973		Y	
William Osler Health System - Brampton	4685	4681	951		Y	FY2018/19
William Osler Health System - Etobicoke	4245	3929	951		Y	FY2018/19
Windsor Regional Hospital - Ouellette	4774	4773	933	DSC	Y	Y

Note: Some institutions are listed multiple times to include all institution and facility numbers due to recent mergers. Reporting will reflect current institution numbers and names.

## Technical Appendix

**Appendix Table 1: Most Responsible Stroke Diagnosis (MRDx) ICD-10CA Codes**

Stroke Type	Code	Diagnosis Description
Hemorrhagic	I60	Subarachnoid haemorrhage
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
Excluded	I608	Other subarachnoid haemorrhage
Excluded	I636	Cerebral infarction due to cerebral venous thrombosis, non-pyogenic

**Appendix Table 2: Discharge and Visit Disposition Codes**

Disposition	Code	Discharge or Visit Disposition Description
Transfer	01	Transferred to an acute care inpatient institution (FY2017/18 and earlier)
Transfer	02	Transferred to continuing care (FY2017/18 and earlier)
Transfer	03	Transferred to other (FY2017/18 and earlier)
Transfer	10	Inpatient Care
Transfer	30	Residential Care
Transfer	40	Group/Supportive Living
Death	07	DAD - Died (FY2017/18 and earlier)
Death	10	NACRS - Death after Arrival (FY2017/18 and earlier)
Death	11	NACRS - Death on Arrival (FY2017/18 and earlier)
Death	71	NACRS - Death on Arrival
Death	72	Died in Facility
Death	73	Medical Assistance in Dying (MAID)
Death	74	Suicide in Facility
Sign-out	06	Sign-out (left against medical advice or absent without leave) (FY2017/18 and earlier)
Sign-out	12	DAD - Did not return from a pass (FY2017/18 and earlier)
Sign-out	61	Absent without leave
Sign-out	62	Left against medical advice
Sign-out	65	Did not return from a pass
Sign-out	66	Died While on Pass/Leave
Sign-out	67	Suicide out of Facility

**Appendix Table 3: Appropriate Level Care and Recommended Time**

Stroke Type	AlphaFIM Range	Stroke Severity	Appropriate Rehab Care Setting	Recommended Time to First Rehab Treatment
Ischemic	81 and up	Mild	Home-based or outpatient (ie in community)	Within 48 hours following discharge from acute care
Ischemic	40 – 80	Moderate	Inpatient	Within 6 days following admission into acute care
Ischemic	Less than 40	Severe	Inpatient	Within 6 days following admission into acute care
Hemorrhagic	81 and up	Mild	Home-based or outpatient (ie in community)	Within 48 hours following discharge from acute care
Hemorrhagic	40 – 80	Moderate	Inpatient	Within 8 days following admission into acute care
Hemorrhagic	Less than 40	Severe	Inpatient	Within 8 days following admission into acute care

Patients following the trajectory of inpatient rehab and on to outpatient or home-based rehab should access these services within 72 hours of inpatient rehab discharge.

**Appendix Table 4: OHIP Billing Codes for Carotid Imaging**

Service Type	Fee Code
Carotid Doppler	J189, J190, J191, J192, J195, J201, J489, J490, J491, J492, J501
Carotid CTA	X404, X417
Carotid MRA	X431, X435
Carotid Angiography	J021, J022, X140, X165, X179, X180, X181, X182

**Appendix Table 5: Procedure (CCI) Codes for Carotid Imaging**

CCI Code	Description
3JE10	X-ray, carotid artery
3JE20	CT carotid artery
3JE30	Ultrasound, carotid artery
3JE40	MRI – carotid artery

**Appendix Table 6: Oral Anticoagulant Drugs**

<b>Generic Name</b>	<b>Drug Identification Number (DIN)</b>
APIXABAN	02377233, 02397714, 09857463
DABIGATRAN ETEXILATE	02312433, 02312441, 02358808, 02468891, 102468905, 02468913
EDOXABAN	02458640, 02458659, 02458667
RIVAROXABAN	02316986, 02378604, 02378612, 02480808
WARFARIN	COUMADIN: 01918311, 01918338, 01918346, 01918354, 01918362, 02007959, 02240205, 02240206  TARO-WARFARIN: 02242680, 02242681, 02242682, 02242683, 02242684, 02242685, 02242686, 02242687  APO-WARFARIN: 02242924, 02242925, 02242926, 02242927, 02242928, 02242929, 02245618

Sources:

<https://www.sac-isc.gc.ca/eng/1572893927371/1572893976394>

<https://www.formulary.health.gov.on.ca/formulary/results.xhtml?q=warfarin&type=1>

<https://www.formulary.health.gov.on.ca/formulary/results.xhtml?q=apixaban&type=1>

<https://www.formulary.health.gov.on.ca/formulary/results.xhtml?q=dabigatran&type=1>

<https://www.formulary.health.gov.on.ca/formulary/results.xhtml?q=edoxaban&type=1>

<https://www.formulary.health.gov.on.ca/formulary/results.xhtml?q=rivaroxaban&type=1>

Note: DINs not listed in the Ontario Drug Benefit Formulary are excluded