

Ontario Telestroke Report 2019-20

June 2021

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Introduction

The Ontario Telestroke Program

ABOUT THE PROGRAM

The primary goal of hyperacute stroke treatment is rapid restoration of blood flow to the affected area of the brain to minimize cell damage and death.^{1,2} This treatment, which includes tissue plasminogen activator (tPA) and/or Endovascular Thrombectomy (EVT), is highly specialized and requires the knowledge and expertise of stroke specialists to ensure safe and effective decision-making.³ Due to the geographical landscape of Ontario and human resource constraints, many hospitals in rural and remote areas of the province do not have access to stroke specialist care onsite. The Ontario Telestroke Program, piloted in 2002 in Northeastern Ontario, was designed to provide timely access to stroke expertise in these underserved areas of the province.

Telestroke is supported by a centralized on-call specialist consultation model and uses two-way videoconferencing and a centralized imaging transfer system to allow the Emergency Department physician and consulting Telestroke neurologists to jointly assess patients, review images and determine the optimal treatment approach. Over time the expansion of treatment options for stroke and the success of the program has warranted expansion to 30 referral sites across the province (FY 2019/20) (Figure 1). These sites vary with respect to their dependency on Telestroke; 24/7 Telestroke sites use Telestroke to support hyperacute stroke care for all eligible patients and PRN (i.e., as needed) sites use Telestroke as needed depending on patient complexity and human resource capacity to provide services.

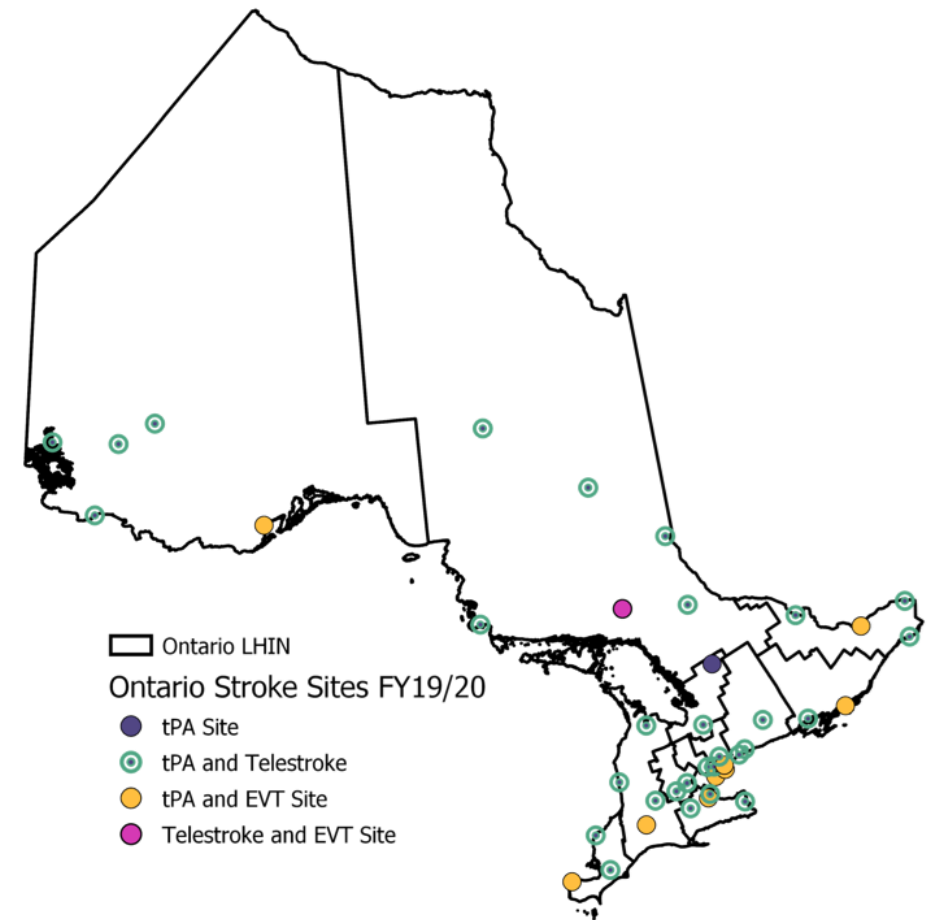


Figure 1: Telestroke in the Ontario Stroke System FY 2019/20

In 2014, to support continued growth of the program, a coordinated provincial strategy was established, leveraging a strategic partnership between the Ontario Telemedicine Network (now Ontario Health-OTN), CritiCall Ontario and the Ontario Stroke Network (now CorHealth Ontario). In collaboration with referring sites and consulting physicians, these organizations work together to manage the program, support equitable access, monitor utilization, facilitate quality improvement and ensure long-term sustainability of the program ([Appendix- Figure 1](#)).

Today, the Ontario Telestroke Program plays a critical role in Ontario's hyperacute stroke system of care ensuring timely access to life and disability saving treatment for patients presenting with acute stroke.

HYPERACUTE STROKE TREATMENT SUPPORTED BY TELESTROKE

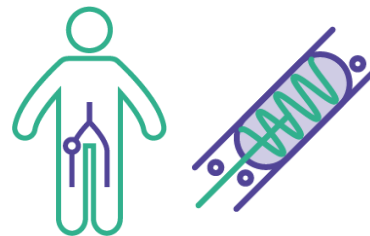
There are two hyperacute treatment options for patients experiencing an acute ischemic stroke: Tissue Plasminogen activator (tPA) and Endovascular Thrombectomy (EVT). tPA was approved in Canada in 1999 for the treatment of acute ischemic stroke.⁴ This thrombolytic medication (or “clot-busting medication”) is administered intravenously with the aim of dissolving clots and restoring blood flow to the brain.⁵ In addition, since 2015⁶, a newer treatment called EVT which aims to mechanically remove stroke-causing clots has been shown to improve patient outcomes after stroke. EVT is the standard of care for strokes caused by blockages in large arteries of the brain.⁶ While tPA is currently limited to 4.5 hours after stroke onset, EVT can potentially be delivered up to 24 hours from stroke onset, with or without concurrent tPA treatment.¹ EVT is a highly specialized procedure that is only provided at 11 hospitals within Ontario.

Timely intervention with hyperacute stroke treatments is critical in reducing brain damage and helping improve outcomes after stroke. The Ontario Telestroke Program brings stroke expertise to the patient by supporting local medical teams to select patients for hyperacute stroke treatment and facilitating access to EVT capable hospitals as appropriate.

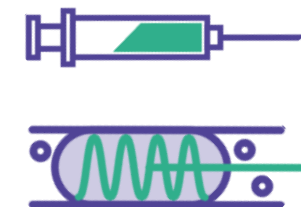
TISSUE PLASMINOGEN ACTIVATOR (tPA)



ENDOVASCULAR THROMBECTOMY (EVT)



tPA and EVT



About This Report

OVERVIEW

This inaugural report provides insight into the performance of the Ontario Telestroke Program with respect to twelve key performance indicators which focus on access, timeliness and patient outcomes. These indicators were identified and prioritized through a modified Delphi process that involved clinical experts and stroke system stakeholders from across the province. Further development and refinement of these indicators was supported by CorHealth Ontario's Hyperacute Performance Measurement and Monitoring Task Group which includes representation from both Telestroke Referral Sites and the Telestroke Neurologist Group.

OBJECTIVE

The long-term objective of this report, when paired with stakeholder engagement, is to establish a performance measurement and monitoring system which can be used by CorHealth Ontario and stroke system stakeholders to monitor and drive quality improvement at the site and provincial program level; however, **due to data quality challenges, the primary objective of this initial report is to socialize the indicators that will be used to monitor and track performance in the future and to highlight the data quality challenges that were identified throughout the report development process.** Although results have been included in this report, it is strongly recommended that caution be used when interpreting key findings.

Sites are encouraged to review the special focus chapter on [Data Quality](#) which includes:

- Site level performance with respect to Canadian Institute for Health Information (CIHI) Special Project (SP) 640 (Field 02) Completion
- Data quality rules that have been applied throughout the report
- New CIHI Special Project 640 (Field 02) completion recommendations for Telestroke Referral Sites

SUPPLEMENTARY FILE

In addition to this report, a supplementary data file has been provided to all Telestroke Referral Sites to enable a more detailed review of performance. This supplementary file includes provincial and site level results for all performance and data quality indicators included in this report, as well as the numerator and denominator used to calculate these results.

Methodology

DATA SOURCES

Indicators in the report are generated by either CorHealth Ontario or by CriteCall Ontario. As CriteCall indicators use a different data source from the ones based on SP640 in CIHI, the cohorts may also differ.

All indicators in the report generated by CorHealth Ontario use health care administrative datasets that were provided by the Ministry of Health:

- Canadian Institute for Health Information (CIHI) Discharge Abstract Database (DAD), including CIHI Special Project 640
- CIHI National Ambulatory Care Reporting System (NACRS), including CIHI Special Project 640

The following six indicators were collaboratively calculated by CriteCall Ontario and CorHealth Ontario using data captured by CriteCall Ontario's Telestroke Case Facilitation and Documentation System:

- Stroke Symptom Onset to Telestroke Initiation
- Time to First Consult
- Average Response Time
- Proportion of Cases where Response Time was Greater than 10 minutes
- Proportion of Telestroke Consults Referred for EVT
- Proportion of EVT Referrals Accepted

DATA QUALITY

After completing a data quality assessment, it was found that in some instances the volume of Telestroke consults captured in CIHI's administrative data did not align with the number of consults reported by CriteCall Ontario. In response to this finding, a data quality cut-off has been applied to indicators that use CIHI's Special Project 640 (field 02) to identify Telestroke consults. Specifically, if a site did not achieve $\geq 60.0\%$ on the data quality indicator: *Ratio of Unique Telstroke Consult Patients Based on SP640 and CriteCall Ontario ("DQI:1")* they have not been included in the report or provincial results. All sites, however, have been included in the supplementary data file.

For more information on data quality and the cut-off which has been used in this report refer to the special focus chapter on [Data Quality](#).

COHORT

Two distinct hospital types are including in this report: Telestroke Sites and Non-Telestroke Hyperacute Sites (Appendix- [Table 1](#), [Table 2](#) and [Figure 2](#)).

The 'Stroke Cohort at Hyperacute Hospitals' is the main analytical cohort used in this report for indicators using CIHI data. This includes unique stroke episodes for patients who first presented at the ED or are admitted into hyperacute hospitals, and patients transferred to a hyperacute hospital within 6 hours of presenting at the ED of a non-hyperacute hospital. Except for indicator *1.1 Proportion of Stroke/TIA patients that Received a Telestroke Consult* where the cohort is stroke patients, all other indicators include only patients who received a Telestroke consult.

SMALL CELL SUPPRESSION

When reporting indicator results, if the sample size ≤ 5 , the values were suppressed and reported as "NR" (not reportable) in order to comply with privacy legislation. Additionally, some information with six or more observations has been suppressed to prevent residual (supplementary) disclosure of other suppressed values. Supplementary suppression is labeled as "SS" throughout the report. Specific suppression rules include:

- Small Cell: If $1 \leq N \text{ Cohort} \leq 5$, then all results will appear as 'NR'
- Small Cell Proportions: If $1 \leq \text{Numerator} \leq 5$, then (numerator and observed rate) will appear as 'NR'
- Supplementary Proportions: If $1 \leq (N \text{ cohort} - \text{numerator}) \leq 5$ (absence of event / outcome), then numerator and observed rate should appear as 'SS'
- Supplementary: For each year (or period), if there is only 1 hospital/stratification with small cell suppression, then the hospital/stratification with the lowest value greater than 5 will have results appear as 'SS'

Additional details on methodology and cohort can be found in the Technical Specifications document.

Abbreviations and Definitions used in Report

ABBREVIATION	DEFINITION
24/7 Telestroke Site	Referring site physicians rely on Telestroke to delivery tPA 24 hrs./day, 7 days per week
CCC	Complex Continuing Care
CIHI	Canadian Institute for Health Information
CT	Computerized Tomography Scan
DAD	Discharge Abstract Database
DIDO	Door in Door Out
DQ	Data Quality
DQI:1	Data Quality Indicator 1: Ratio of Unique Telstroke Consult Patients Based on SP640 and CritiCall Ontario
DTN	Door To Needle
ED	Emergency Department
EVT	Endovascular Thrombectomy
FY	Fiscal Year
LTC	Long-Term Care
MIN	Minutes
NACRS	National Ambulatory Care Reporting System
NR	Not Reportable
ON DQ TC	Ontario Telestroke Consults from Sites Meeting the Data Quality Cut-Off
ON HS	Ontario Hyperacute Sites
ON TC	Ontario Telestroke Consults
PRN Telestroke Site	Telestroke is only used when required (e.g., gaps in local coverage, complex/EVT patients)
SS	Complementary Suppression
TIA	Transient Ischemic Attack
tPA	Tissue Plasminogen Activator

Hospital Abbreviations used in Report

HOSPITAL NAME	ABBREVIATION
Alexandra Marine And General Hospital	AMGH
Bluewater Health - Sarnia General	BWH-S
Brant Community Healthcare Sys - Brantford	BCHSYS
Chatham-Kent Health Alliance - Chatham	CKHA
Cornwall Community Hospital	CCH
Dryden Regional Health Centre	DRHC
Grand River Hospital Corp - Waterloo	GRH
Grey Bruce Health Services - Owen Sound	GBHS-OS
Guelph General Hospital	GGH
Hawkesbury And District General Hospital	HDGH
Health Sciences North - Laurentian	HSN
Huron Perth Healthcare Alliance - Stratford General Hospital	SGH
Joseph Brant Hospital	JBH
Lake-Of-The-Woods District Hospital	LWDH
Lakeridge Health - Ajax	LH-A
Lakeridge Health - Oshawa	LH-O
Mackenzie Health - Richmond Hill Hospital	MH
North Bay Regional Health Centre	NBRHC
Notre Dame Hospital (Hearst)	HNDH
Pembroke Regional Hospital	PRH
Peterborough Regional Health Centre	PRHC
Quinte Healthcare Corporation - Belleville	QHC- BGH
Riverside Health Care Facilities (La Verendrye)	RHCF
Royal Victoria Regional Health Centre	RVH
Sault Area Hospital - Sault Ste Marie	SAH
Sioux Lookout Meno-Ya-Win Health Centre (District)	SLMYW
Temiskaming Hospital	TH
Timmins & District General Hospital	TADGH
William Osler Health System - Brampton (Civic)	WOHS-B
William Osler Health System - Etobicoke	WOHS-E



Data Quality

Data Quality Assessment

FOCUS OF DATA QUALITY ASSESSMENT

A mechanism to identify patients that receive a Telestroke consultation is critical to measuring and understanding both the utilization and quality of the Ontario Telestroke Program. Therefore, prior to completing the indicator analysis, CorHealth undertook an evaluation of the completeness of *Field 02: Telestroke Consultation* in the Canadian Institute for Health Information's (CIHI) stroke special project 640.

CIHI Special Project 640 (Field 02)

Telestroke Consultation data is mandatory for collection in the province of Ontario. This data is collected through CIHI's Discharge Abstract Database (DAD) and National Ambulatory Care Reporting System (NACRS), using special project 640 field 02. Acute care facilities are required to indicate whether a patient with an applicable condition used Telestroke services during their care. Applicable conditions include patients who have been diagnosed with⁷⁻¹⁰:

- Ischemic Stroke
- Unspecified Stroke
- Hemorrhagic Stroke
- Transient ischemic attack
- Intracranial & intraspinal phlebitis
- Thrombophlebitis
- Nonpyrogenic thrombosis of intracranial venous system, and
- Central retinal artery occlusion

For a complete list of ICD-10-CA Codes refer to Appendix- [Table 3](#).

METHODOLOGY

To quantify the completeness of special project 640 *Field 02: Telestroke Consultation*, CorHealth Ontario developed the data quality indicator: *Ratio of Unique Telestroke Consult Patients Based on SP640 and CitiCall Ontario ("DQI:1")*. This indicator compares the number of unique patients with Telestroke consults captured by CitiCall Ontario's Telestroke Case Facilitation and Documentation System to the number of unique patients captured in CIHI special project 640 (Appendix- [Table 4](#)).

Telestroke Case Facilitation and Documentation System

CitiCall Ontario facilitates Telestroke cases through its provincial Call Centre. Eligible Referring Telestroke hospitals have been identified by CorHealth and OTN. Referring Telestroke hospitals contact CitiCall Ontario's Call Centre to request a Telestroke consultation with the Telestroke consulting physician on-call for the

Telestroke program. CritiCall Ontario connects the Telestroke referring hospital with the Telestroke consulting physician and documents the details in CritiCall Ontario's Case Facilitation Documentation System, Eceptionist. This system includes time stamps and standard documentation fields that are used to generate data for Telestroke cases that are connected through CritiCall Ontario's Call Centre service.

SELECTING A REFERENCE STANDARD

CritiCall Ontario has several quality audits in place to support ongoing data quality. Validation rules are created and applied to all cases based on specified criteria for the case type. Telestroke validation rules include referring and consulting hospital eligibility, as well as associated outcomes (e.g., transfer, referral). This data has long been accepted and used by the Ontario Telestroke Partners and stroke system to monitor and track Telestroke volumes.

In this data quality assessment regarding the number of Telestroke consults, CritiCall Ontario's Telestroke Case Facilitation and Documentation System was considered to be the reference standard, given the maturity of CritiCall Ontario's Telestroke Case Facilitation and Documentation System with respect to reporting and monitoring volumes, as well as its ability to capture all Telestroke consults irrespective of final diagnosis and/or outcomes.

Although CritiCall Ontario's data is considered the reference standard, it should be noted that their documentation ends with the referral to Telestroke. Furthermore, Telestroke Consults captured through the Telestroke Case Facilitation Documentation System cannot be linked to other administrative data sets such as CIHI DAD and NACRS, requiring the use of CIHI's SP 640 to identify Telestroke Consults for select indicators.

RESULTS

Aggregate results of all Telestroke Sites showed poor agreement between Special Project 640 and the reference standard (1847 consults recorded in SP 640 versus 2841 consults captured by CritiCall; 60% agreement). Across sites, agreement ranged from 0% to 110%. Predominately, where inconsistencies existed, lower consult counts were captured in project 640; however, four sites recorded a higher number of consults in SP 640 than what was captured in CritiCall Ontario's Telestroke Case Facilitation and Documentation System. Aggregate and site level results are provided in Appendix- [Table 5](#).

LIMITATIONS

Current CIHI SP project 640 completion guidelines may be contributing to the lack of agreement between SP 640 counts and the reference standard. In particular:

- Telestroke is designed to support patients experiencing symptoms of acute stroke. It is expected that after consulting with the Telestroke Neurologists, some patients will receive a final diagnosis that is not stroke/TIA. CIHI completion guidelines, however, only require project 640 to be completed for patients who have been diagnosed with one of the applicable conditions listed previously (Appendix- [Table 3](#)).⁷⁻¹⁰ Conversely, CritiCall Ontario's Telestroke Case Facilitation and Documentation System captures all Telestroke Consults irrespective of final diagnosis.
- For cases where the patient is transferred to another ED facility in the same continuous episode of care, only the final receiving ED facility is required to complete the Special Project.⁹ The final receiving facility may not use Telestroke and the consult may subsequently not be captured.

The impact of these factors on the data quality results is unknown and may warrant further investigation at the site level; however, it is unlikely that these factors alone would result in the magnitude of inconsistencies observed. Additional analysis which aimed to better understand the role of transfers with respect to DQI:1 contradicted the hypothesis that sites with higher transfer rates would have poorer performance with respect to DQI:1. In fact, the median number of transfers for high performing sites (DQI:1 > 80%) was 66 in fiscal year 2019/20, compared to 24 for the lower performing sites (DQI:1 <80%) (Appendix- [Table 6](#)).

Further investigation is required to understand the lack of agreement between CIHI SP 640 and CritiCall Ontario’s Case Facilitation and Documentation System data. **To minimize the impact of completion guidelines on DQI:1 it is strongly recommended that sites expand current data capture to include:**

- Complete SP 640, Field 02 for **any** patient that receives a Telestroke Consult irrespective of ICD-10-CA code
- Complete SP 640, Field 02 for cases where the patient **is transferred** to another ED facility after receiving a Telestroke Consult

Addressing Data Quality in the Report

Based on key findings from the data quality assessment, indicator results may be impacted by inconsistent capture of patients who received a Telestroke consult. To mitigate the impact of this data quality issue, a data quality threshold of 60.0% has been adopted for indicators that use CIHI’s Special Project 640 (field 02) to identify Telestroke consults throughout this report. Specifically, for these indicators, sites that did not achieve ≥ 60.0% with respect to the DQI:1 are not included in the report or in aggregate results (Figure 2). These sites, however, will receive their results in the supplementary data file. Site level results for DQI:1 can be found in Appendix- [Table 5](#).

A cut-off of 60.0% was used in the report to reflect current SP 640 completion guidelines and the potential role that these guidelines may have with respect to DQI:1 results. This threshold may be adjusted in future iterations of the report to reflect new recommendations with respect to SP 640 (field 02) and to continue to drive ongoing data quality improvement across the program.

Figure 2: Site Inclusion/Exclusion

INCLUDED IN REPORT (≥60.0%)		EXCLUDED FROM REPORT (≤60.0%)
<ul style="list-style-type: none">• Alexandra Marine And General Hospital• Brant Community Healthcare Sys - Brantford• Chatham-Kent Health Alliance - Chatham• Cornwall Community Hospital• Dryden Regional Health Centre• Grey Bruce Health Services - Owen Sound• Guelph General Hospital• Health Sciences North - Laurentian• Stratford General Hospital• Mackenzie Health - Richmond Hill Hospital	<ul style="list-style-type: none">• North Bay Regional Health Centre• Notre Dame Hospital (Hearst)• Pembroke Regional Hospital• Peterborough Regional Health Centre• Quinte Healthcare Corporation - Belleville• Riverside Health Care Facilities (La Verendrye)• Royal Victoria Regional Health Centre• Temiskaming Hospital• Timmins & District General Hospital	<ul style="list-style-type: none">• Bluewater Health - Sarnia General• Grand River Hospital Corp - Waterloo• Hawkesbury & District General Hospital• Joseph Brant Hospital• Lake-Of-The-Woods District Hospital• Lakeridge Health - Ajax• Lakeridge Health - Oshawa• Sault Area Hospital - Sault Ste Marie• Sioux Lookout Meno-Ya-Win Health Centre (District)• William Osler Health System - Brampton (Civic)• William Osler Health System - Etobicoke

IMPROVING DATA QUALITY

Data quality is critical to understanding the performance of the Ontario Telestroke Program and informing clinical quality improvement initiatives. As described in the preceding section, concerns regarding the quality of data used to identify Telestroke patients in this report have been identified. **Due to the inability to confidently identify Telestroke service use, the useability of this report to drive clinical change is limited.** Although strategies have been implemented to mitigate the impact of poor data quality in this report (i.e., application of a data quality cut-off), caution should be exercised when interpreting indicator results. Efforts to improve the quality of this data are needed to enable ongoing reporting in this area.

Strategies to Improve Data Quality

Data quality is “the whole of planned and systematic procedures that take place before, during and after data collection to guarantee the quality of data in a database...for its intended use.”¹¹ Therefore, to improve data quality, it is critical that sites target all aspects of the data collection processes including clinical documentation and data abstraction. Consider the following strategies when working with stakeholders at your site to improve data quality:

- Leverage the descriptive analysis and data quality questions included in the [Appendix- Table 7](#) to better understand the use of CIHI’s Special Project 640 (field 02) at your site and potential factors that may be contributing to poor data capture.
- Ensure the health record/health information management department is aware of your site's participation in Telestroke and establish documentation practices that ensure information is captured in a consistent manner and location.
- Establish monthly data quality huddles with coders and stroke subject matter experts. These meetings will demonstrate the importance of the data and provide an opportunity to double check the data with experts.
- Develop internal queries which will enable identification of data quality issues prior to submission to CIHI.

To further support site level data quality improvement initiatives, CorHealth Ontario will be implementing the following strategies over the next year (FY 2021/2022):

- Dissemination of data quality results to Regional Stroke Program Directors, District Stroke Coordinators and Telestroke Site Leads
- Biannual update of DQI:1 results
- Hosting a series of Telestroke Knowledge Exchanges

Telestroke Knowledge Exchange

To coincide with the release of the inaugural report, CorHealth Ontario will be hosting a Telestroke Knowledge Exchanges to bring together clinicians, administrators and subject matter experts to share and discuss challenges and opportunities that may enable ongoing improvement of the program.



Indicator Results



Chapter 1: Telestroke Initiation

This chapter focuses on the pathways that lead up to the first connection between the referring physician and the Telestroke Neurologist.

KEY HIGHLIGHTS:

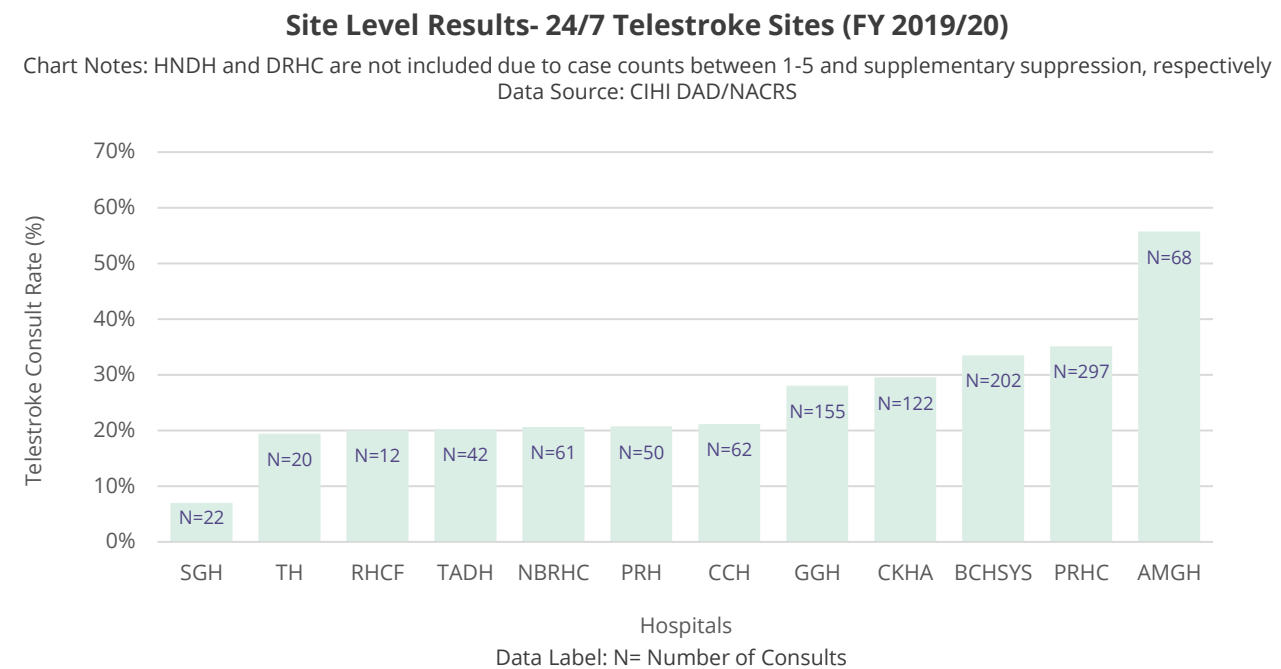
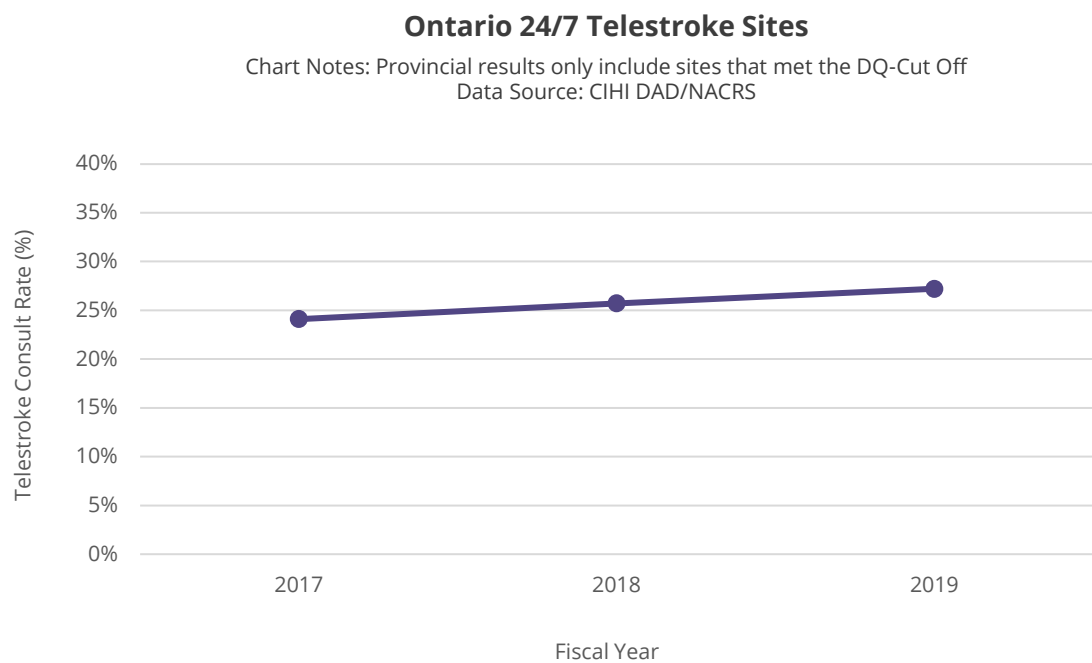
- The proportion of stroke patients presenting to a 24/7 Telestroke Site that received a Telestroke consult increased from 24% to 27% over the past three years (FY 2017-2019)
- In fiscal year 2019/2020 the median time from stroke symptom onset to Telestroke initiation (i.e initial call to CritiCall Ontario) was 125 minutes.
- The average response time for Telestroke Neurologists in fiscal year 2019/2020 was 3 minutes (target ≤ 10 minutes).

Chapter 1: Telestroke Initiation

Indicator 1.1: Proportion of Stroke/TIA Patients at Telestroke Sites who Received a Telestroke Consult

Indicator Description:

This indicator reports the proportion of Stroke/TIA patients that received a Telestroke Consult after presenting to a 24/7 Telestroke Site.



Interpretation Considerations

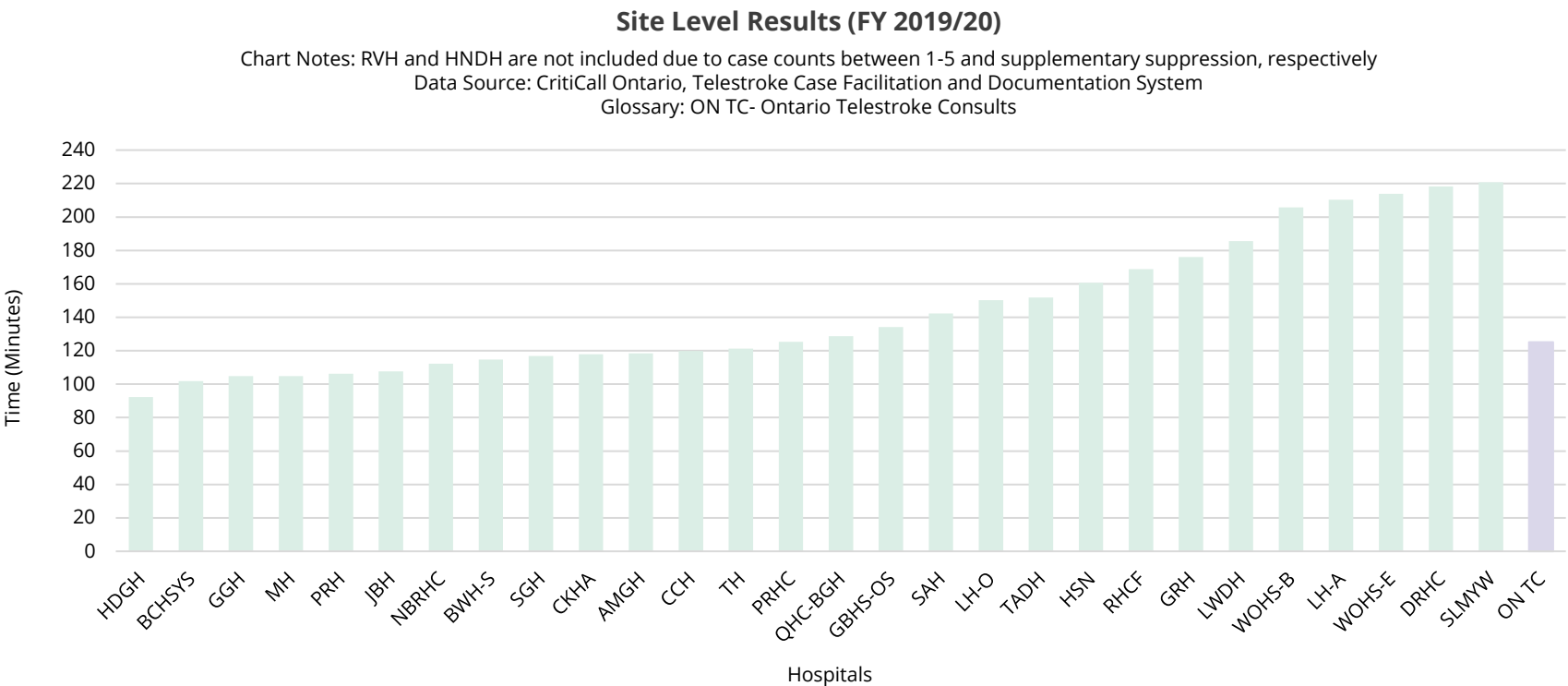
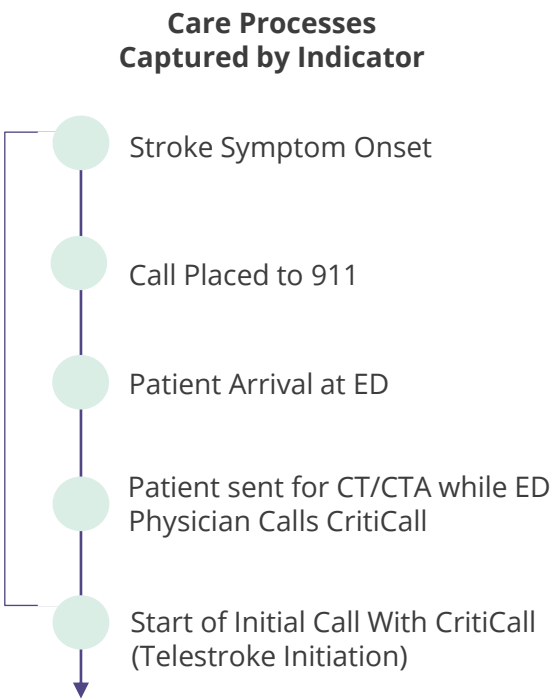
- Only sites that achieved $\geq 60.0\%$ for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CritiCall* have been included in the provincial results and data visualizations.
- This indicator is exploratory; a higher proportion of consults may reflect overuse and/or inappropriate referrals, whereas a lower proportion may reflect underuse of the service. Sites should be utilizing the Telestroke Referral Worksheet to identify Telestroke eligible patients.
- Referring physicians at 24/7 Telestroke Sites rely on Telestroke to deliver tPA and/or access EVT 24 hours a day, 7 days a week; however, this indicator does not take into consideration stroke symptom onset (SSO) time and may include patients presenting greater than 24 hours post SSO. These patients are not appropriate for Telestroke consultation; a consult rate of 100% is not expected.
- The increased proportion of stroke/TIA patients receiving Telestroke consultations over the past three years may reflect the advent of EVT and subsequent expansion of the time window to 12 hours in 2019 (note: the 24-hour treatment time window expansion which occurred in 2021 is not captured in this data).

Chapter 1: Telestroke Initiation

Indicator 1.2: Stroke Symptom Onset to Telestroke Initiation (Minutes)

Indicator Description:

This indicator reports the median time, in minutes, from stroke symptom onset to the start of the initial call with Critical Ontario (i.e., Telestroke initiation).



Interpretation Considerations

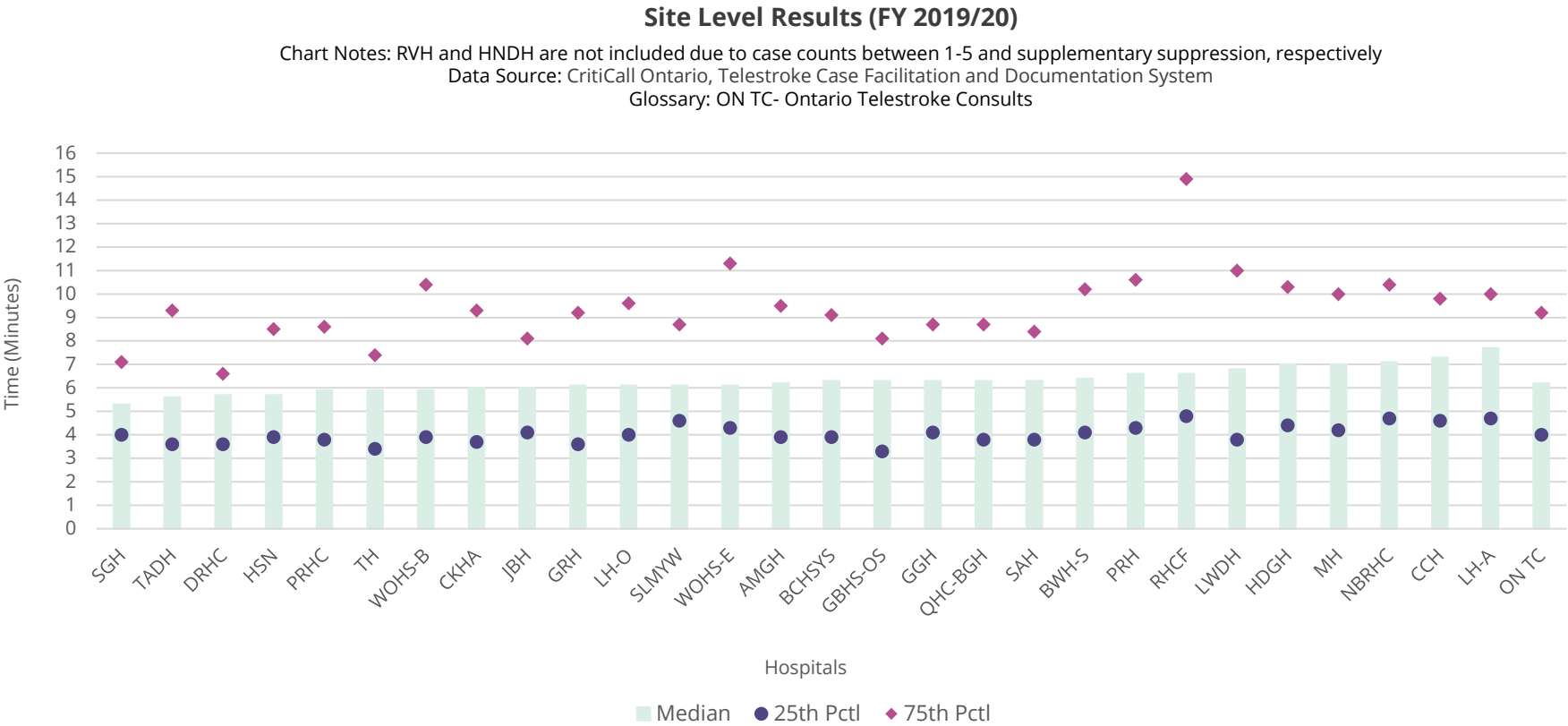
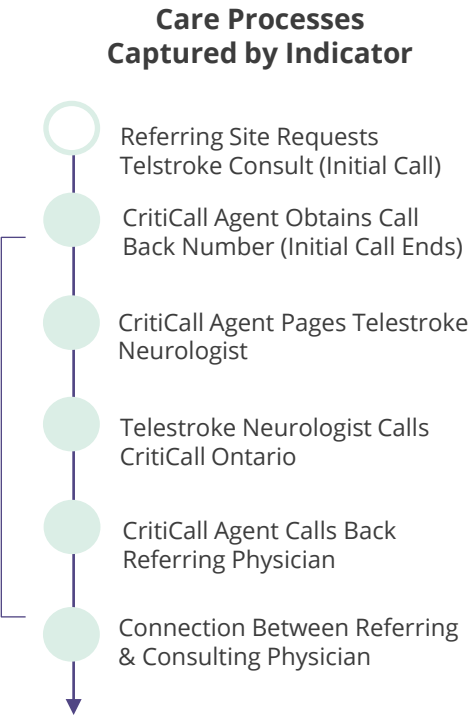
- This indicator was calculated using data from CriteCall Ontario's Telestroke Case Facilitation and Documentation System; the 60% Data Quality cut-off has **not** been applied.
- The stroke symptom onset time used to calculate this indicator reflects the verbal report provided to the CriteCall agent by the ED physician (or delegate) during the initial call. In some instances, this time may be an estimate and/or the last known well time.
- Currently there is no validated target for this indicator; a lower value is desired.
- Site performance may be influenced by patient behaviour (e.g., delays in seeking medical attention) and/or distance to hospital; hospitals need to take into consideration pre-hospital factors that may be influencing results. Ideally, this indicator would start at patient arrival (i.e., door time); however, this data is currently not linkable (i.e., CIHI and CriteCall Data).
- Site performance may be influenced by access to 24/7 onsite CT/CTA personnel.

Chapter 1: Telestroke Consultation

Indicator 1.3: Time to First Consult (Minutes)

Indicator Description:

This indicator reports the median time, in minutes, from **the end** of the initial call to CriteCall to **the start** of the first call/connection between the referring physician and Telestroke physician.



Interpretation Considerations

- This indicator was calculated using data from CriteCall Ontario's Telestroke Case Facilitation and Documentation System; the 60% Data Quality cut-off has **not** been applied.
- Currently there is no validated target for this indicator; a lower time is desired.

Chapter 1: Telestroke Consultation

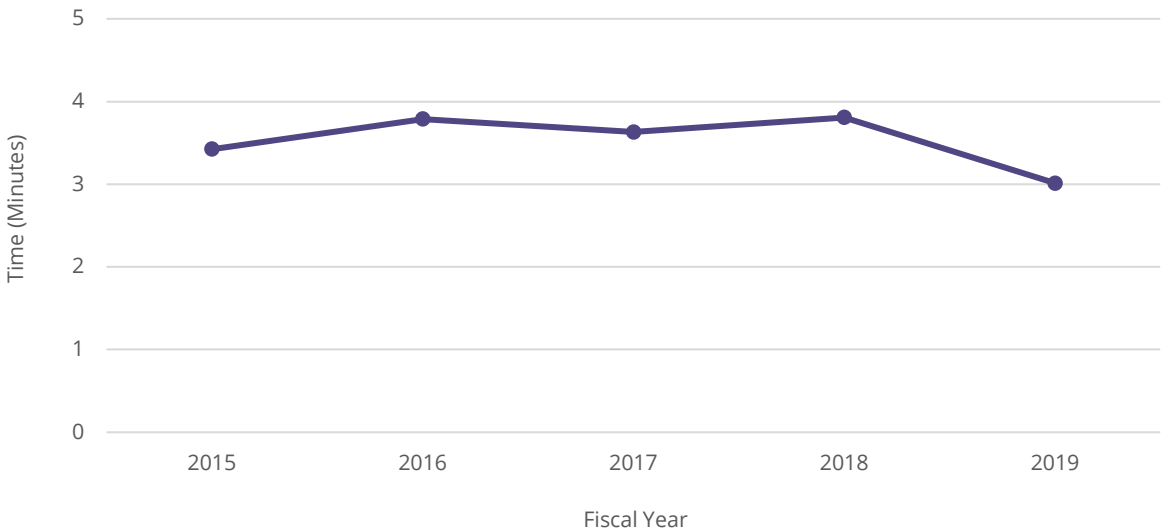
Indicator 1.4 & 1.5: Average Response Time (Minutes) & Proportion of Cases where Response Time was Greater than 10 Minutes

Indicator Description:

- Average Response Time: This indicator reports the average (mean) time, in minutes that it takes the Telestroke Neurologist to respond to the page from CriteCall Ontario.
- Proportion of Cases where Response Time was Greater than 10 minutes: Number of Telestroke cases where the stroke specialist was delayed (response time was greater than 10 minutes).

Ontario Telestroke Consults Average Response Time

Data Source: CriteCall Ontario, Telestroke Case Facilitation and Documentation System



Ontario Telestroke Consults- Highlights from FY 2019/2020

Data Source: CriteCall Ontario's Telestroke Case Facilitation and Documentation System

Average (Mean) Response Time for All Consults (Minutes)	3.01
Proportion of Cases with Response Time > 10 Minutes	9%

Interpretation Considerations

- This indicator was calculated using data from CriteCall Ontario's Telestroke Case Facilitation and Documentation System; the 60% Data Quality cut-off has **not** been applied.
- Telestroke Neurologists are expected to respond to pages from CriteCall Ontario in less than 10 minutes.
- A Primary/Secondary call model is used to support the Ontario Telestroke Program (i.e., there are two Telestroke neurologists on call for the province, a primary and a back-up). CriteCall Ontario will not page the primary Telestroke neurologist if they are already attending to a call. Instead, the back-up Telestroke neurologist will be paged. The response time reported includes a mixture of primary and secondary responses.
- Some Telestroke cases have more than one consult and more than one response time; all response times are included.
- The average response time reports the mean and may be influenced by outlier values.



Chapter 2: Treatment

This chapter focuses on timely access to life-saving hyperacute stroke treatments: tissue plasminogen activator (tPA) and Endovascular Thrombectomy (EVT).

KEY HIGHLIGHTS:

- The proportion of Telestroke consults that received tPA decreased from 40% to 34% over the past three years (FY 2017-2019)
- In fiscal year 2019/20, the Median Door to Needle time for Telestroke patients was 57 minutes (target 30 minutes)
- In fiscal year 2019/20, 11% of all Telestroke consults were referred for EVT. Of those referred, 77% were accepted
- In fiscal year 2019/20, the median door in door out time for Telestroke patients transferred to an EVT site was 119 minutes (target 45 minutes)

Chapter 2: Treatment

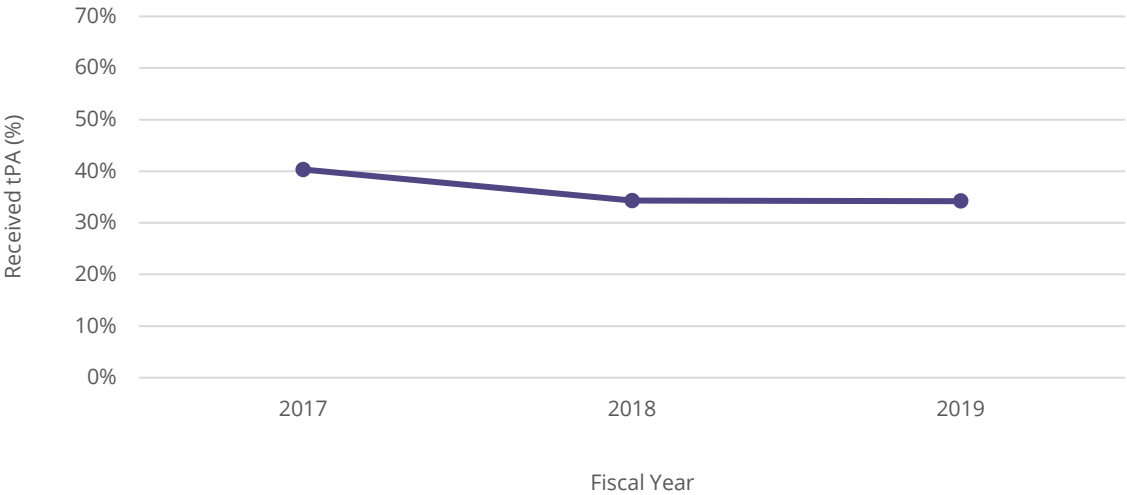
Indicator 2.1: Proportion of Ischemic/Unspecified Telestroke Consults Treated with tPA

Indicator Description:

This indicator reports the proportion of ischemic/unspecified Telestroke consults that received Tissue Plasminogen Activator (tPA).

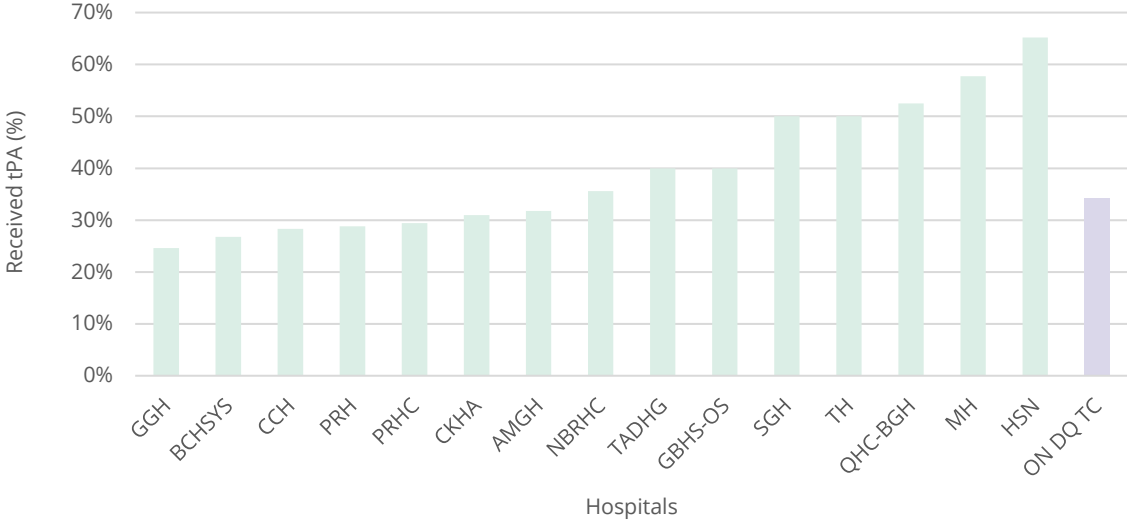
Ontario Telestroke Consults

Chart Notes: Provincial results only include consults from sites that met the DQ-Cut Off
Data Source: CIHI DAD/NACRS



Site Level Results (FY 2019/20)

Chart Notes: DRHC, HNDH, RHCF, RVH are not included due to case counts between 1-5
Data Source: CIHI DAD/NACRS
Glossary: ONT DQ TC- Ontario Telestroke Consults From Sites Meeting DQ Cut Off



Interpretation Considerations

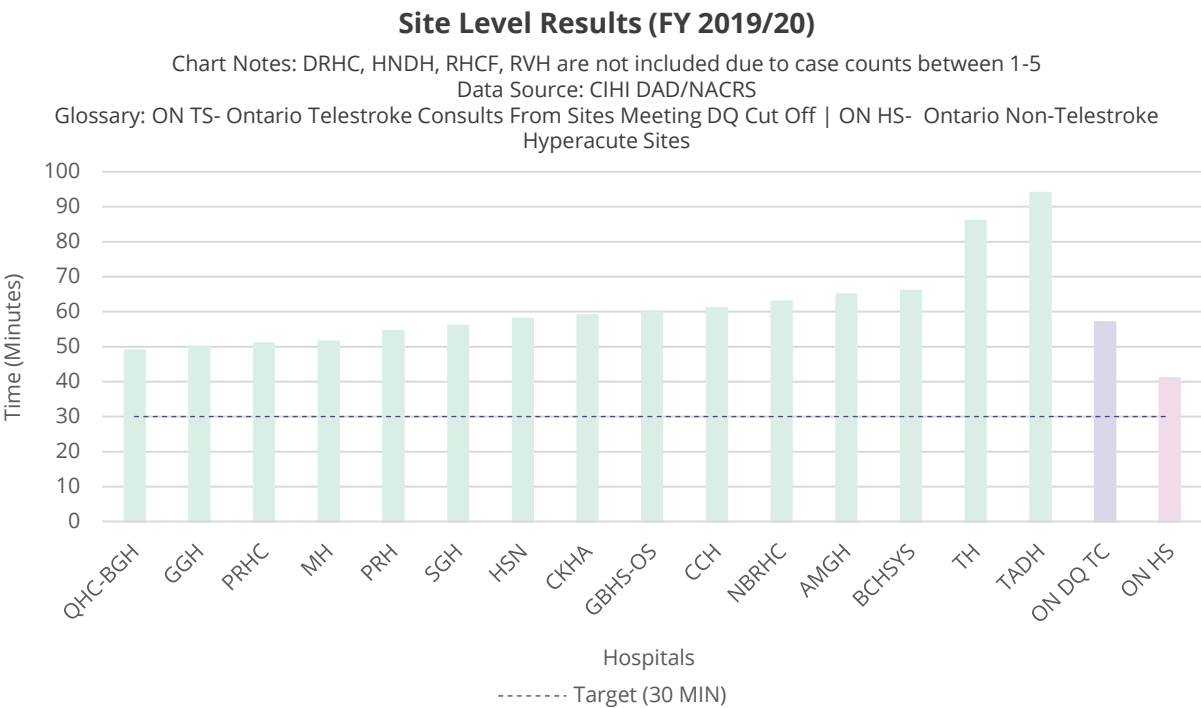
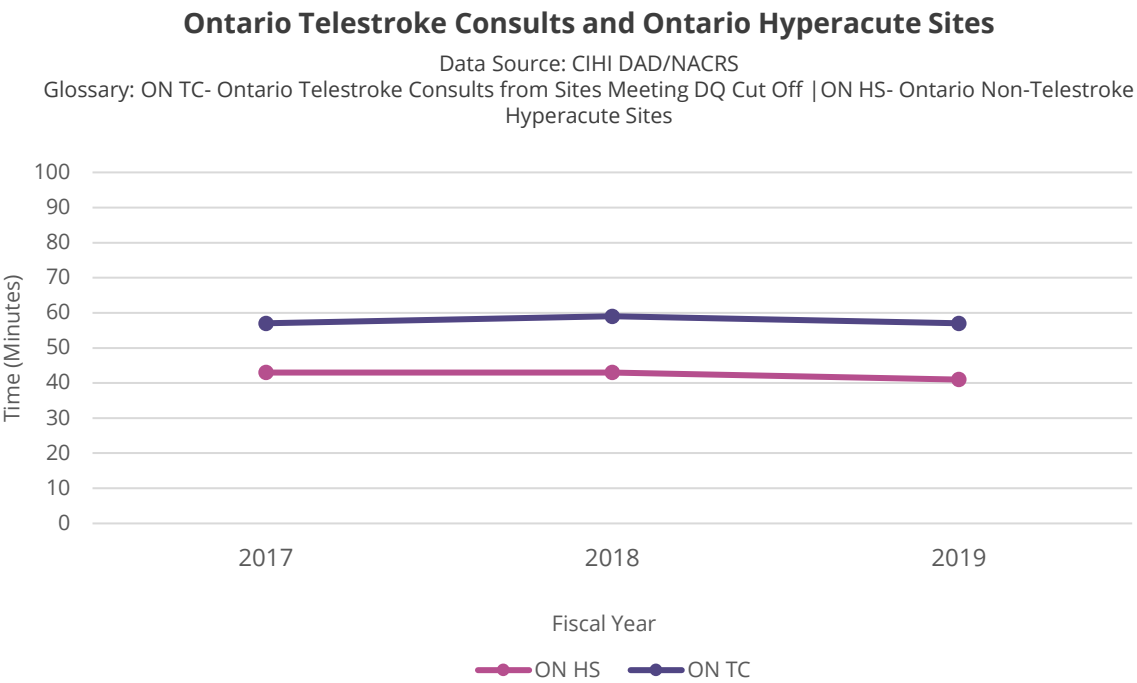
- Only sites that achieved $\geq 60.0\%$ for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CritiCall* have been included in the provincial results and data visualizations.
- Currently there is no validated targets for this indicator; a higher treatment rate is desired.
- This indicator does not take into consideration the 4.5-hour treatment window. Site performance may be influenced by patient behaviour (e.g., delays in seeking medical attention). Hospitals need to take into consideration pre-hospital factors that may be influencing results. Sites should be utilizing the Telestroke Referral Worksheet to identify Telestroke eligible patients.
- This indicator does not take into consideration patient factors which may influence tPA eligibility (e.g., prescribed and using direct non-vitamin k oral anticoagulants).
- PRN Telestroke Sites may have a lower rate if Telestroke is leveraged for EVT only.
- A decrease in the proportion of Telestroke consults receiving tPA over the past three years is expected given the expanded scope of Telestroke to support EVT referral (i.e., Telestroke is now used to support patients who may be ineligible for tPA).

Chapter 2: Treatment

Indicator 2.2: Door to Needle Time (DTN) for Telestroke Patients (Minutes)

Indicator Description:

This indicator reports the median time, in minutes, between a stroke patient’s registration/triage in the emergency department and the time intravenous thrombolysis with tissue plasminogen activator (tPA) was administered.



Interpretation Considerations

- Only sites that achieved $\geq 60.0\%$ for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CritiCall* have been included in the provincial results and data visualizations
- For this indicator, a lower value is desired; the target of 30 minutes has been adopted from the Canadian Stroke Best Practice Recommendations.¹
- Ontario Hyperacute Sites include all non-Telestroke sites that administer tPA (as indicated by CorHealth Ontario’s 2019/20 Hospital Resource Inventory). A list of these sites can be found in the appendix (Appendix-Table 8). It should be noted that Telestroke Consults represent only a select group of ischemic/unspecified stroke patients from the Telestroke site. In contrast, all ischemic/unspecified patients presenting to the non-Telestroke hyperacute site are included in the comparator. Ideally, when data quality improves and Telestroke Consults can be identified with more accuracy, Telestroke Consults would be compared to non-Telestroke consults at both Telestroke and Non-Telestroke Hyperacute Sites.

Chapter 2: Treatment

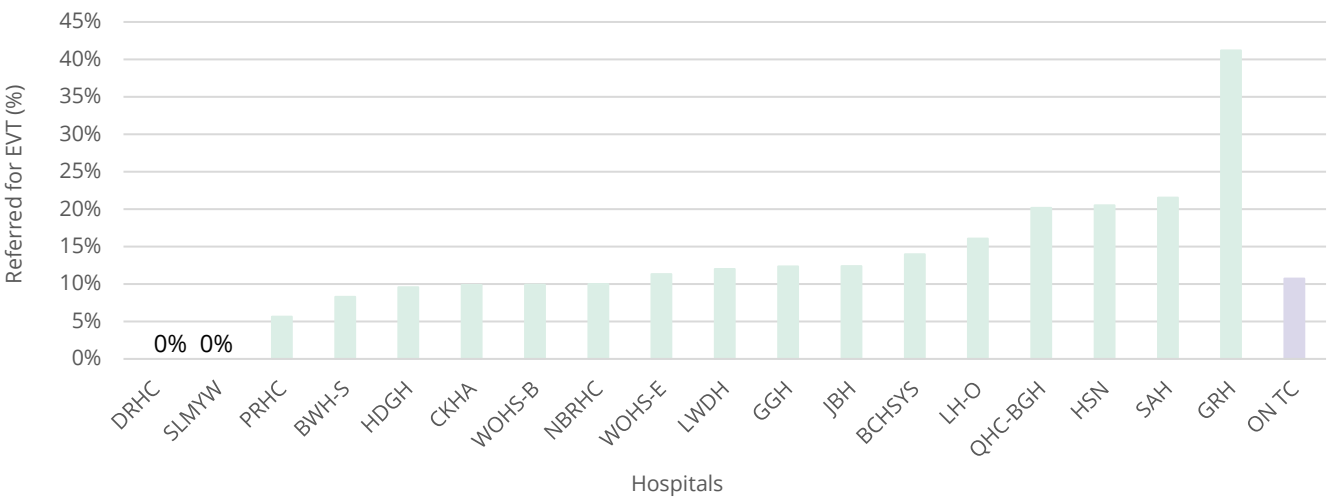
Indicator 2.3 & 2.4: Proportion of Telestroke Consults Referred for EVT & Proportion of EVT Referrals Accepted

Indicator Description:

- Proportion of Telestroke Cases Referred for EVT: This indicator reports the proportion of Telestroke consults where the Telestroke Neurologists called CriteCall back and requested an EVT Consult.
- Proportion of EVT Referrals Accepted: This indicator reports the proportion of Telestroke EVT Referrals where the EVT Team accepted the patient for transport.

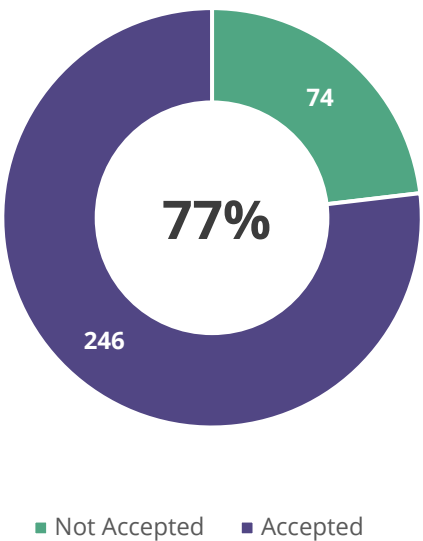
Proportion of Telestroke Consults Referred for EVT- Site Level Results (FY 2019/20)

Chart Notes: AMGH CCH GBHS HNDH LH-A MH PRH RHCF RVH HPHA TH TADHG are not included due to case counts between 1-5
Data Source: CriteCall Ontario, Telestroke Case Facilitation System
Glossary: ON TC- Ontario Telestroke Consults



Ontario Telestroke Consults- Proportion of EVT Referrals Accepted (FY 2019/20)

Data Source: CriteCall Ontario, Telestroke Case Facilitation System



Interpretation Considerations

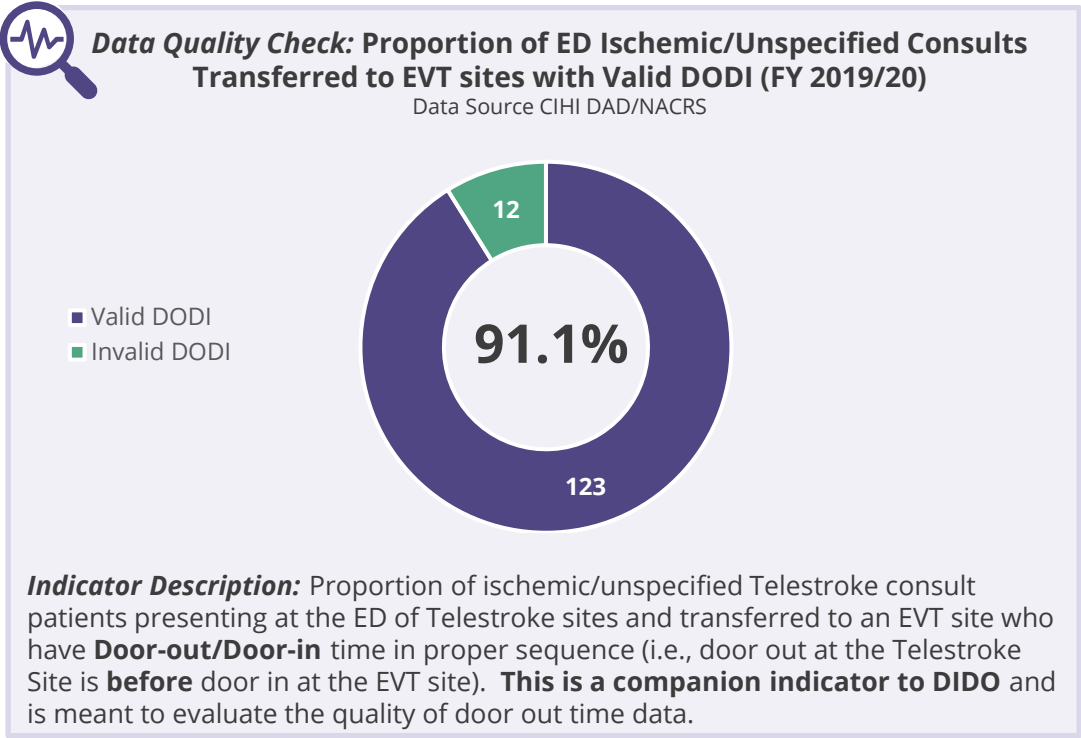
- These indicators were calculated using data from CriteCall Ontario’s Telestroke Case Facilitation and Documentation System; the 60% Data Quality cut-off has **not** been applied.
- Currently there are no validated targets for either of these indicators.
- As per CorHealth Ontario’s EVT Report, 5.4% of **all** ischemic stroke patients (Telestroke and non-Telestroke) received EVT in FY 19/20.¹² It should be noted that patients receiving Telestroke consults represent a subset of all ischemic stroke patients; therefore, the proportion eligible may be higher than that observed in the broader Acute Ischemic Stroke population due to pre-screening.
- Although the patient was accepted for EVT the ultimate outcome (i.e., whether the patient received EVT) is not captured by this indicator.

Chapter 2: Treatment

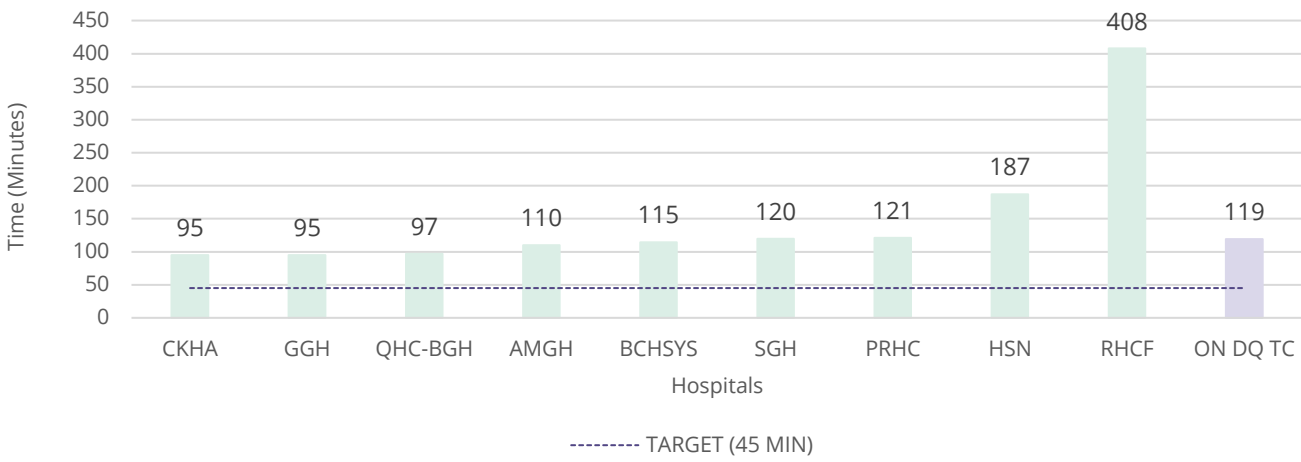
Indicator 2.5: Door in Door Out (DIDO) Time (Minutes)

Indicator Description:

This indicator reports the median time, in minutes, between the entry time and discharge time in the emergency department (ED) at a Telestroke site among ischemic/unspecified Telestroke consult patients transferred to an EVT site.



Ontario Telestroke Sites- Door in Door Out Time (FY 2019/20)
Chart Notes: CCH, DRHC, GBHS, NBRHC, PRH, RVH, TH, TADH are not included due to case counts between 1-5 ; MH did not have any applicable cases
Data Source: CIHI DAD/NACRS
Glossary: ON DQ TC- Ontario Telestroke Consults from Sites Meeting DQ Cut-Off



Interpretation Considerations

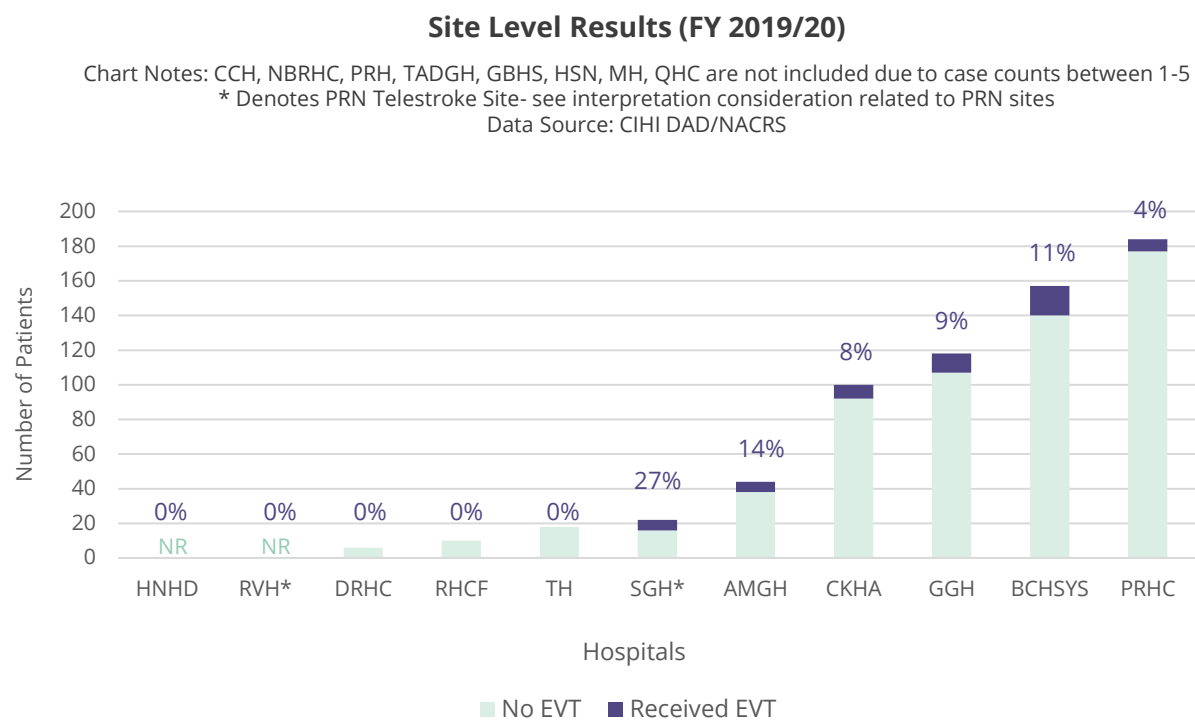
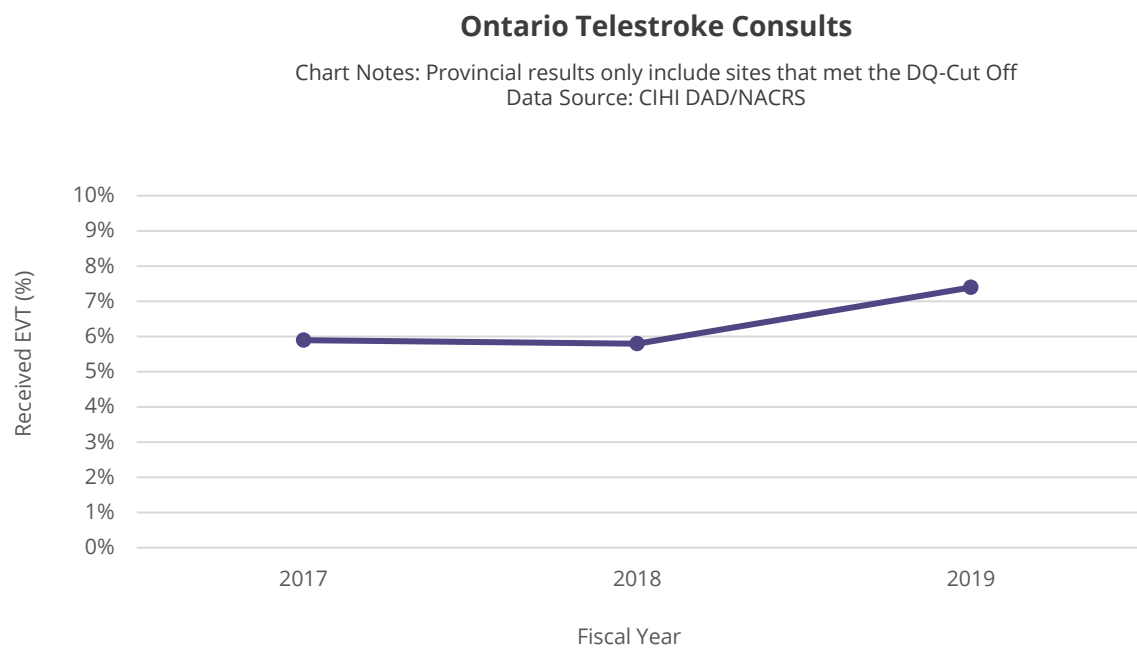
- Only sites that achieved ≥60.0% for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CriteCall* have been included in the provincial results and data visualizations
- Records with invalid **DODI** time have been excluded from results (i.e., Telestroke ED door-out time is **after** entry time at EVT Site). This data quality issue may reflect coding at the Telestroke or EVT site.
- For this indicator, a lower value is desired; the target of 45 minutes is adopted from the Canadian Stroke Best Practice Recommendations, Key Performance Indicators.¹³
- Rapid door in door out times is critical for patients being transferred for EVT. Patient-level data for transfer purpose, however, is currently not available to CorHealth. As such, all Telestroke consults transferred to an EVT site are considered to be transfers for EVT; it is possible that transfers may be for reasons other than EVT (e.g., stroke unit care) where time may not be as critical.

Chapter 2: Treatment

Indicator 2.6: Proportion of Telestroke Consults that Received EVT

Indicator Description:

This indicator reports the proportion of Telestroke Consults that received Endovascular Thrombectomy Treatment.



Interpretation Considerations

- Only sites that achieved $\geq 60.0\%$ for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CritiCall* have been included in the provincial results and data visualizations
- This indicator uses a different data source than that used to calculate the proportion of Telestroke Consults referred and accepted for EVT (indicators 2.3 and 2.4); therefore, the results may not align and should be considered independently.
- PRN Telestroke sites (e.g., RVH, SGH- noted with a * in graph) use Telestroke as needed depending on patient complexity and human resource capacity to provide services; therefore, these percentages do not represent overall access to EVT for these sites since pathways other than Telestroke are also used to access EVT.
- Low volumes and site location should be taken into consideration when interpreting indicator results.
- As per CorHealth Ontario's EVT Report, 5.4% of **all** ischemic stroke patients (Telestroke and non-Telestroke) received EVT in FY 19/20.¹² It should be noted that patients receiving Telestroke consults represent a subset of all ischemic stroke patients; therefore, the proportion eligible may be higher than that observed in the broader Acute Ischemic Stroke population due to pre-screening.



Chapter 3: Patient Outcomes

*This chapter focuses on the effectiveness of the Ontario Telestroke Program by exploring the In-Hospital Mortality Rate for patients who received a Telestroke Consult**

KEY HIGHLIGHTS:

- Over the past three years (fiscal year 2017-2019) the provincial mortality rate for patients receiving Telestroke Consults decreased from 9.5% to 8.2%
- Three-year aggregate (fiscal year 2017-2019) in-hospital mortality rate for patients receiving Telestroke Consults was highest in those experiencing a hemorrhagic stroke (27%) and lowest in those experiencing a Transient Ischemic Attack (1%)

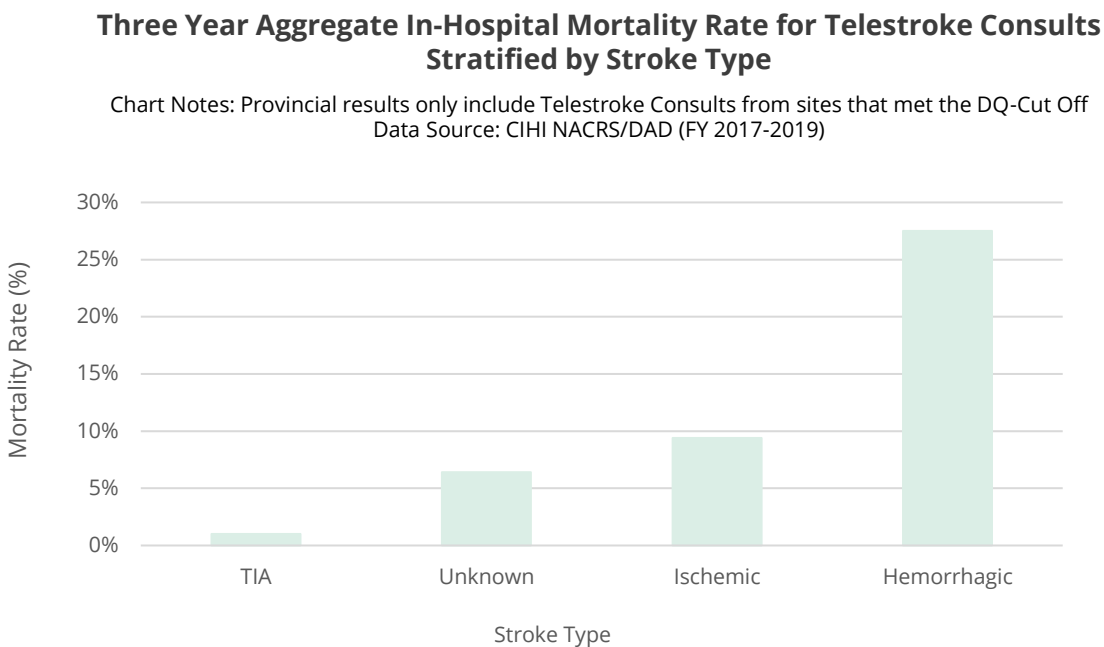
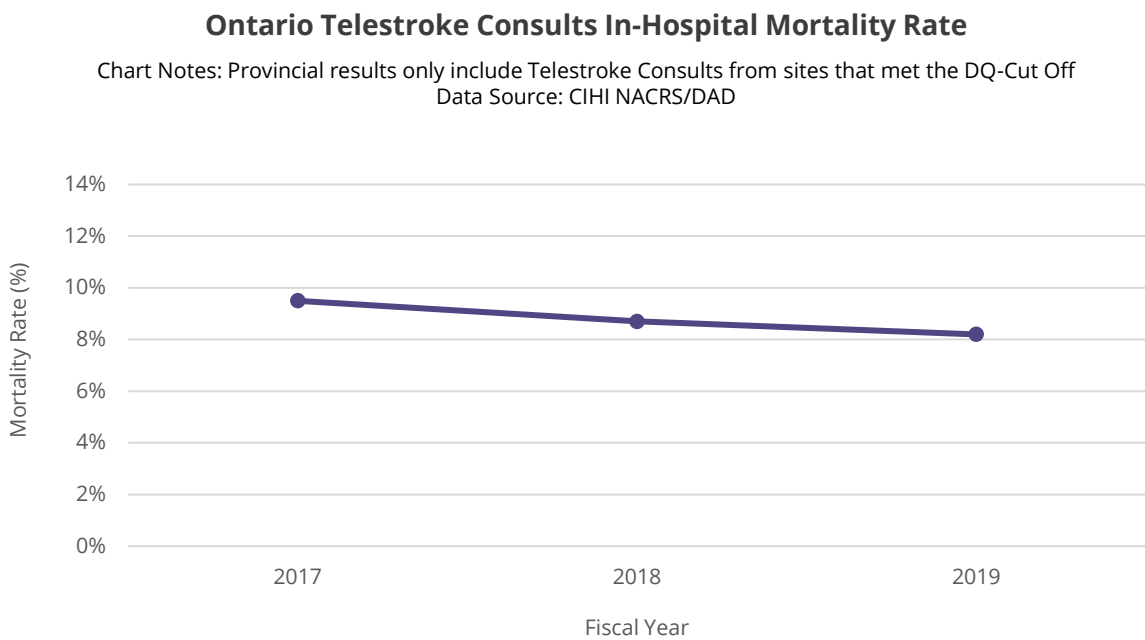
**While discharge disposition is an indicator of interest for future reporting (i.e., proportion of Telestroke Consults Discharged from Acute Care to Complex Continuing Care/Long-Term Care), small cell counts currently influence results and may mislead interpretation, hence this outcome indicator has not been included in this report. Individual sites may view their results in the supplementary data file. Caution should be exercised when interpreting results.*

Chapter 3: Patient Outcomes

Indicator 3.1: In-Hospital Mortality for Patients that Received a Telestroke Consult

Indicator Description:

In-Hospital Mortality: This indicator reports the proportion of Telestroke consults who died in-hospital during their episode of care



Interpretation Considerations

- Only sites that achieved $\geq 60.0\%$ for the DQI: 1 *Ratio of Unique Telestroke Consult Patients Based on SP640 and CritiCall* have been included in the provincial results and data visualizations.
- The Telestroke outcome indicators are not risk adjusted. Therefore, factors like patient characteristics such as age, stroke severity, and comorbidities may contribute to explaining some of the observed variation year over year.
- Due to a high proportion of small cells (i.e., values between 1-5), site level outcome data has not been included in this report. Individual sites may view their results in the supplementary data file.



Acknowledgements & References

Acknowledgements

- CorHealth Ontario wishes to acknowledge the Telestroke hospitals and Telestroke Neurologist Group for their dedication to providing access to high quality stroke care to all Ontarians.
- CorHealth Ontario serves as system support to the Ontario Ministry of Health (MOH), Local Health Integration Networks (LHINs) and care providers and is dedicated to improving quality, efficiency, access and equity in the delivery of adult cardiac, vascular and stroke services in Ontario. CorHealth Ontario is funded by the MOH.
- CorHealth Ontario wishes to acknowledge CritiCall Ontario, OTN and the Hyperacute Performance Measurement and Monitoring Task Group for their help in developing the performance indicators contained in this report.
- Administrative datasets were provided by the Ontario Ministry of Health (MOH). The views expressed in this report are views of CorHealth Ontario and do not necessarily reflect those of the MOH.
- Telestroke Case Facilitation and Documentation System data and the associated indicators were provided by CritiCall Ontario. The views expressed in this report are views of CorHealth Ontario and do not necessary reflect those of CritiCall Ontario.

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Appendix

Appendix- Figure 1: Ontario Telestroke Partners



OTN

- Offers Technology solutions and support
- Establishes consultant on-call roster
- Provides on-call roster and consultant contact information to CritiCall Ontario
- Manages on-call remuneration for consultants



CritiCall Ontario

- Follows established process algorithm for Telestroke cases
- Receives requests from sites participating in Telestroke
- Contacts the primary/secondary consultant as per on call roster provided by OTN
- Connects Telestroke consultant with referring physician
- Documents and reports on key process indicators



CorHealth Ontario

- Set standards/parameters for determination of new Telestroke sites by regions/LHIN
- Develops/reviews/updates knowledge translation resources (e.g., protocols, clinical toolkit)
- Provides support for measuring, monitoring quality improvement and sustainability of the program



Consulting Physicians

- Provides assessment, treatment, recommendations and documentation
- Provide 24 hours on-call coverage
- Medical Director: provides clinical, administrative and quality assurance for the program

Appendix- Table 1: Telstroke Sites

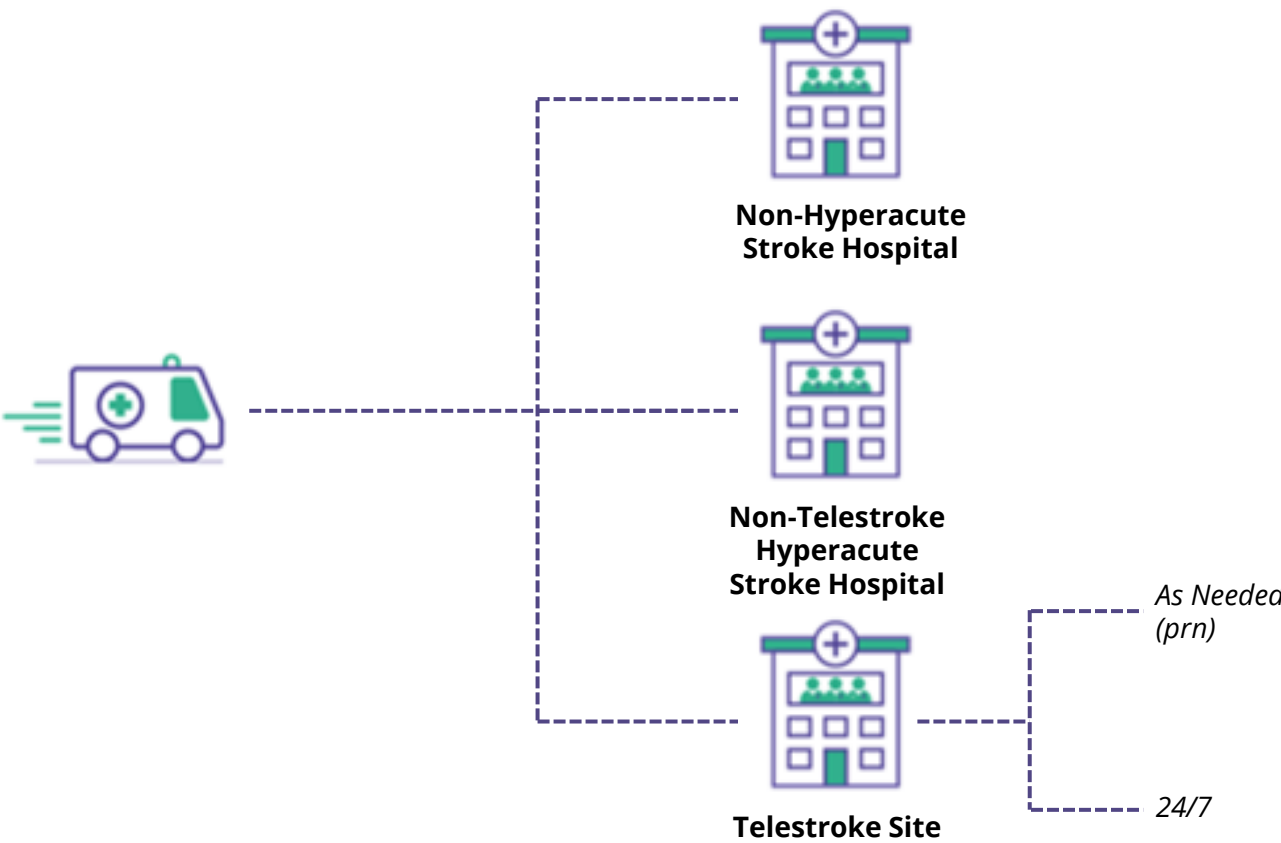
Institution Name	Telestroke Model	Telestroke Activation Date	tPA	EVT
Alexandra Marine and General Hospital	24/7	Feb-11	X	
Bluewater Health - Sarnia General Site	24/7	Jun-14	X	
Brant Community Healthcare Sys – Brantford	24/7	Dec-19	X	
Chatham Kent Health Alliance – Chatham	24/7	Mar-19	X	
Cornwall Community Hospital	24/7	Dec-10	X	
Dryden Regional Health Centre	24/7	Dec-09	X	
Grand River Hospital Corp - Waterloo Site	PRN	Mar-13	X	
Grey Bruce Health Services - Owen Sound	PRN	Dec-14	X	
Guelph General Hospital	24/7	Dec-13	X	
Hawkesbury And District General Hospital	24/7	Jan-11	X	
Health Sciences North – Laurentian	PRN	Mar-03	X	X
Huron Perth Healthcare Alliance - Stratford	PRN	Nov-16	X	
Joseph Brant Hospital – Burlington	24/7	Jun-16	X	
Lake-Of-The-Woods District Hospital	24/7	Feb-08	X	
Lakeridge Health - Ajax Site	24/7	Sep-11	X	
Lakeridge Health - Oshawa Site	PRN	May-09	X	
Mackenzie Health	PRN	Dec-19	X	
North Bay Regional Health Centre	24/7	Jul-02	X	
Notre-Dame Hospital (Hearst)	24/7	Nov-19	X	
Pembroke Regional Hospital Inc.	24/7	Oct-05	X	
Peterborough Regional Health Centre	24/7	Mar-06	X	
Quinte Healthcare Corporation – Belleville	PRN	Dec-10	X	
Riverside Health Care Fac - Laverendrye	24/7	Mar-10	X	
Royal Victoria Regional Health Centre	PRN	Sep-12	X	
Sault Area Hospital - Sault Ste Marie	24/7	Aug-05	X	
Sioux Lookout Meno-Ya-Win Health Centre	24/7	Feb-13	X	
Temiskaming Hospital	24/7	Mar-10	X	
Timmins & District General Hospital	24/7	Sep-05	X	
William Osler Health System - Brampton	24/7	Aug-16	X	
William Osler Health System - Etobicoke	24/7	Aug-16	X	

Note: Niagara Health System – Greater Niagara is excluded from the Telestroke Report as it utilizes a local Telestroke model

Appendix- Table 2: Non-Telestroke Hyperacute Sites

Institution Name	tPA	EVT
Halton Healthcare Services - Oakville	X	
Hamilton Health Sciences Centre - General	X	X
Kingston Health Sciences Centre - General	X	X
London Health Sciences Centre - University	X	X
Muskoka Algonquin Healthcare - Huntsville	X	
Niagara Health System - Greater Niagara*	X	
Sunnybrook Health Sciences Centre	X	X
The Ottawa Hospital - Civic	X	X
Thunder Bay Regional Health Sciences Centre	X	X
Trillium Health Partners - Mississauga	X	X
Unity Health Toronto - St. Michael's	X	X
University Health Network - Toronto Western	X	X
Windsor Regional Hospital – Ouellette	X	X

Figure 2: Different Types of Sites



NON-HYPERACUTE STROKE HOSPITAL

Not capable of administering tPA and/or EVT. Patients may be transported to a non-hyperacute stroke hospital if they do not meet the Emergency Medical Services Acute Stroke Bypass Protocol and it is the closest hospital. Patients who walk-in to these sites in the <6 hours time window are immediately transferred to appropriate treatment sites. These regional protocols are expanding to be inclusive of the expanded EVT treatment window and may include access to imaging and consultation at Telestroke hospitals.

Non-Telestroke Hyperacute Stroke Hospital

Able to offer thrombolytic therapy and EVT to suitable ischemic stroke patients 24/7 with the support of on-site clinicians with stroke expertise

TELESTROKE HOSPITAL

Able to offer thrombolytic therapy but requires Telestroke to enable 24/7 coverage or requires assistance based on patient complexity and/or human resource capacity to provide the service.

Appendix- Table 3: List of ICD-10-CA Codes Applicable to Project 640

HEMORRHAGIC STROKE	
Code	Description
I60.0	Subarachnoid haemorrhage from carotid siphon and bifurcation
I60.1	Subarachnoid haemorrhage from middle cerebral artery
I60.2	Subarachnoid haemorrhage from anterior communicating artery
I60.3	Subarachnoid haemorrhage from posterior communicating artery
I60.4	Subarachnoid haemorrhage from basilar artery
I60.5	Subarachnoid haemorrhage from vertebral artery
I60.6	Subarachnoid haemorrhage from other intracranial arteries
I60.7	Subarachnoid haemorrhage from intracranial artery, unspecified
I60.8	Other subarachnoid haemorrhage
I60.9	Subarachnoid haemorrhage, unspecified
I61.0	Intracerebral haemorrhage in hemisphere, subcortical
I61.1	Intracerebral haemorrhage in hemisphere, cortical
I61.2	Intracerebral haemorrhage in hemisphere, unspecified
I61.3	Intracerebral haemorrhage in brain stem
I61.4	Intracerebral haemorrhage in cerebellum
I61.5	Intracerebral haemorrhage, intraventricular
I61.6	Intracerebral haemorrhage, multiple localized
I61.8	Other intracerebral haemorrhage
I61.9	Intracerebral haemorrhage, unspecified
Obstetric population	
O99.40– Diseases of the circulatory system complicating pregnancy, childbirth and the puerperium AND a code from category I60.– or I61.– assigned diagnosis type 3	
ISCHEMIC STROKE	
Code	Description
I63.0	Cerebral infarction due to thrombosis of precerebral arteries
I63.1	Cerebral infarction due to embolism of precerebral arteries
I63.2	Cerebral infarction due to unspecified occlusion or stenosis of precerebral arteries
I63.3	Cerebral infarction due to thrombosis of cerebral arteries
I63.4	Cerebral infarction due to embolism of cerebral arteries
I63.5	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries
I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
I63.8	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
Obstetric population	
O99.40– Diseases of the circulatory system complicating pregnancy, childbirth and the puerperium AND a code from category I63.– assigned diagnosis type 3	
UNSPECIFIED STROKE	
Code	Description
I64	Stroke, not specified as haemorrhage or infarction
Obstetric population	
O99.40– Diseases of the circulatory system complicating pregnancy, childbirth and the puerperium AND code I64 assigned diagnosis type 3	

Continues On Next Page

Appendix- Table 3: List of ICD-10-CA Codes Applicable to Project 640 (continued)

Transient Ischemic Attack	
Code	Description
G45.0	Vertebro-basilar artery syndrome
G45.1	Carotid artery syndrome (hemispheric)
G45.2	Multiple and bilateral precerebral artery syndromes
G45.3	Amaurosis fugax
G45.8	Other transient cerebral ischaemic attacks and related syndromes
G45.9	Transient cerebral ischaemic attack, unspecified
Obstetric population	
O99.30– Mental disorders and diseases of the nervous system complicating pregnancy, childbirth and the puerperium AND one of the following codes — G45.0, G45.1, G45.2, G45.3, G45.8 or G45.9 — assigned diagnosis type 3	
Transient Retinal Artery Occlusion	
Code	Code Description
H34.0	Transient Retinal artery occlusion
Obstetric population	
O99.80– Other specified diseases and conditions complicating pregnancy, childbirth and the puerperium AND code H34.0 assigned diagnosis type 3	
Thrombosis of intracranial venous system (venous etiology)	
Code	Code Description
G08	Intracranial and intraspinal phlebitis and thrombophlebitis
O22.5-	Cerebral venous thrombosis in pregnancy
O87.3-	Cerebral venous thrombosis in puerperium
I67.6	Nonpyogenic thrombosis of intracranial venous system (Excludes: when causing infarction see I63.6)
Obstetric population	
O99.40– Diseases of the circulatory system complicating pregnancy, childbirth and the puerperium AND code I67.6 assigned diagnosis type 3	
Central retinal artery occlusion	
Code	Code Description
H34.1	Central retinal artery occlusion
Obstetric population	
O99.80– Other specified diseases and conditions complicating pregnancy, childbirth and the puerperium AND code H34.1 assigned diagnosis type 3	

Table 4: Technical Specifications for Ratio of Unique Telstroke Consult Patients Based on SP640 and CritiCall Ontario (DQI:1)

Indicator Definition	Ratio of stroke/TIA patients at Telestroke sites who received a Telestroke consult based on CIHI and CritiCall data
Data Source(s)	DAD, NACRS, CritiCall
Denominator	Unique patients with Telestroke consults based on CritiCall within the fiscal year.
Numerator	Unique patients with Telestroke consults based on special project 640 (SP640) data within the fiscal year, as defined by any of the following: <ul style="list-style-type: none">• SP640 Field 2 = 'Y' in a NACRS• SP640 Field 2 = 'Y' in a DAD
Calculation	$\frac{\text{Number of consult patients based on SP640}}{\text{Number of consult patients based on CritiCall}}$
Unit of Analysis	Patients
Reporting Level(s)	<ul style="list-style-type: none">• Province• Telestroke site
Interpretation	A higher rate is desired and indicates the degree completeness in capturing Telestroke consults in CIHI data compared to CritiCall.

Appendix- Table 5: Ratio of Unique Telstroke Consult Patients Based on SP640 and CritiCall Ontario (DQI:1)

Telestroke Site	SP640 Consults	CritiCall Consults	Ratio	Target	Performance Relative to Target
All Telestroke Sites	1,847	2841	65.0%	60%	INLIER
TS 24/7 Model	1,559	2524	61.8%	60%	INLIER
TS PRN Model	288	317	90.9%	60%	INLIER
Alexandra Marine And General Hospital	74	104	71.2%	60%	INLIER
Bluewater Health - Sarnia General	67	153	43.8%	60%	LOW
Brant Community Healthcare Sys - Brantford	237	226	104.9%	60%	INLIER
Chatham-Kent Health Alliance - Chatham	136	220	61.8%	60%	INLIER
Cornwall Community Hospital	72	104	69.2%	60%	INLIER
Dryden Regional Health Centre	8	12	66.7%	60%	INLIER
Grand River Hospital Corp - Waterloo	13	SS	SS	60%	LOW
Grey Bruce Health Services - Owen Sound	51	61	83.6%	60%	INLIER
Guelph General Hospital	175	252	69.4%	60%	INLIER
Hawkesbury & District General Hospital	0	52	0.0%	60%	LOW
Health Sciences North - Laurentian	27	35	77.1%	60%	INLIER
Huron Perth Healthcare Alliance - Stratford General Hospital	33	30	110.0%	60%	INLIER
Joseph Brant Hospital	93	214	43.5%	60%	LOW
Lake-Of-The-Woods District Hospital	16	38	42.1%	60%	LOW
Lakeridge Health - Ajax	17	40	42.5%	60%	LOW
Lakeridge Health - Oshawa	46	77	59.7%	60%	LOW
Mackenzie Health - Richmond Hill Hospital	43	37	116.2%	60%	INLIER
North Bay Regional Health Centre	66	88	75.0%	60%	INLIER
Notre Dame Hospital (Hearst)	6	10	60.0%	60%	INLIER
Pembroke Regional Hospital	60	60	100.0%	60%	INLIER
Peterborough Regional Health Centre	330	450	73.3%	60%	INLIER
Quinte Healthcare Corporation - Belleville	101	122	82.8%	60%	INLIER
Riverside Health Care Facilities (La Verendrye)	14	14	100.0%	60%	INLIER
Royal Victoria Regional Health Centre	7	NR	NR	60%	INLIER
Sault Area Hospital - Sault Ste Marie	36	62	58.1%	60%	LOW
Sioux Lookout Meno-Ya-Win Health Centre (District)	6	17	35.3%	60%	LOW
Temiskaming Hospital	24	37	64.9%	60%	INLIER
Timmins & District General Hospital	49	43	114.0%	60%	INLIER
William Osler Health System - Brampton (Civic)	34	121	28.1%	60%	LOW
William Osler Health System - Etobicoke	6	100	6.0%	60%	LOW

Data Source: CIHI DAD/NACRS (FY 2019/20) and CritiCall Ontario's Telestroke Case Facilitation and Documentation System(FY 2019/20)

Appendix- Table 6: Could Transfers be Contributing to Poor Data Capture?

Telestroke Site	ED Cases	Transfers	DQI:1
Dryden Regional Health Centre	41	6	66.7%
Temiskaming Hospital	96	8	64.9%
Notre Dame Hospital (Hearst)	32	9	60.0%
Sioux Lookout Meno-Ya-Win Health Centre (District)	37	10	35.3%
Timmins & District General Hospital	190	10	114.0%
Lakeridge Health - Ajax	319	13	42.5%
Bluewater Health - Sarnia General	465	15	43.8%
Hawkesbury And District General Hospital	107	17	0.0%
Sault Area Hospital - Sault Ste Marie	273	18	58.1%
Lake-Of-The-Woods District Hospital	82	19	42.1%
Riverside Health Care Facilities (La Verendrye)	59	20	100.0%
North Bay Regional Health Centre	277	22	75.0%
Joseph Brant Hospital	401	26	43.5%
William Osler Health System - Etobicoke	527	28	6.0%
Chatham-Kent Health Alliance - Chatham	381	31	61.8%
Cornwall Community Hospital	258	32	69.2%
Grey Bruce Health Services - Owen Sound	337	36	83.6%
Quinte Healthcare Corporation - Belleville	479	43	82.8%
William Osler Health System - Brampton (Civic)	689	49	28.1%
Alexandra Marine And General Hospital	117	54	71.2%
Health Sciences North - Laurentian	576	55	77.1%
Lakeridge Health - Oshawa	878	56	59.7%
Huron Perth Healthcare Alliance - Stratford General Hospital	289	63	110.0%
Pembroke Regional Hospital	216	68	100.0%
Guelph General Hospital	512	74	69.4%
Brant Community Healthcare Sys - Brantford	564	81	104.9%
Grand River Hospital Corp - Waterloo	756	93	SS
Royal Victoria Regional Health Centre	857	143	NR
Peterborough Regional Health Centre	812	167	73.3%
Mackenzie Health - Richmond Hill Hospital	896	201	116.2%

Data Source: CIHI DAD/NACRS (FY 2019/20) and CritiCall Ontario's Telestroke Case Facilitation and Documentation System (FY 2019/20)

Appendix- Table 7: Descriptive Analysis and Data Quality Questions

1. Are transfers contributing to lack of agreement between CIHI Special Project 640 (Field 02) and CritiCall's Telestroke Case Facilitation and Documentation System? Are we currently completing SP 640, Field 02 for cases where the patient is transferred to another ED facility after receiving a Telestroke Consult? Tip: If you add the number of transfers to SP 640 does it equal/bring you closer CritiCall?
2. Is it likely that your site administers tPA without the use of Telestroke? If no, does the number of patients that received tPA match the number that received tPA via Telestroke? If no, should these cases have been captured in SP 640 (Field 02)?

Care Model	Telestroke Site	SP640 Consults	CritiCall Consults	Ratio	ED Cases	Transfers	Received tPA	Received tPA through Telestroke
TS 24/7	Alexandra Marine And General Hospital	74	104	71.2%	117	54	14	14
TS 24/7	Bluewater Health - Sarnia General	67	153	43.8%	465	15	27	14
TS 24/7	Brant Community Healthcare Sys - Brantford	237	226	104.9%	564	81	42	42
TS 24/7	Chatham-Kent Health Alliance - Chatham	136	220	61.8%	381	31	30	31
TS 24/7	Cornwall Community Hospital	72	104	69.2%	258	32	14	13
TS 24/7	Dryden Regional Health Centre	8	12	66.7%	41	6	NR	NR
TS 24/7	Guelph General Hospital	175	252	69.4%	512	74	31	29
TS 24/7	Hawkesbury & District General Hospital	0	52	0.0%	107	17	9	N/A
TS 24/7	Huron Perth Healthcare Alliance - Stratford General Hospital	33	30	110.0%	289	63	25	11
TS 24/7	Joseph Brant Hospital	93	214	43.5%	401	26	33	23
TS 24/7	Lake-Of-The-Woods District Hospital	16	38	42.1%	82	19	NR	NR
TS 24/7	Lakeridge Health - Ajax	17	40	42.5%	319	13	8	NR
TS 24/7	North Bay Regional Health Centre	66	88	75.0%	277	22	16	16
TS 24/7	Notre Dame Hospital (Hearst)	6	10	60.0%	32	9	NR	NR
TS 24/7	Pembroke Regional Hospital	60	60	100.0%	216	68	11	10
TS 24/7	Peterborough Regional Health Centre	330	450	73.3%	812	167	52	53
TS 24/7	Riverside Health Care Facilities (La Verendrye)	14	14	100.0%	59	20	NR	NR
TS 24/7	Sault Area Hospital - Sault Ste Marie	36	62	58.1%	273	18	23	16
TS 24/7	Sioux Lookout Meno-Ya-Win Health Centre (District)	6	17	35.3%	37	10	NR	NR
TS 24/7	Temiskaming Hospital	24	37	64.9%	96	8	10	9
TS 24/7	Timmins & District General Hospital	49	43	114.0%	190	10	12	12
TS 24/7	William Osler Health System - Brampton (Civic)	34	121	28.1%	689	49	14	NR
TS 24/7	William Osler Health System - Etobicoke	6	100	6.0%	527	28	10	0
TS PRN	Grand River Hospital Corp - Waterloo	13	SS	SS	756	93	53	NR
TS PRN	Grey Bruce Health Services - Owen Sound	51	61	83.6%	337	36	65	14
TS PRN	Health Sciences North - Laurentian	27	35	77.1%	576	55	50	15
TS PRN	Lakeridge Health - Oshawa	46	77	59.7%	878	56	94	12
TS PRN	Mackenzie Health - Richmond Hill Hospital	43	37	116.2%	896	201	128	15
TS PRN	Quinte Healthcare Corporation - Belleville	101	122	82.8%	479	43	55	42
TS PRN	Royal Victoria Regional Health Centre	7	NR	NR	857	143	78	NR

Data Source: CIHI DAD/NACRS (FY 2019/20) and CritiCall Ontario's Telestroke Case Facilitation and Documentation System(FY 2019/20)

Appendix- Table 8: Ontario Hyperacute Sites (Non-Telestroke)

Institution Name	RSC or DSC	tPA Provider	EVT Provider
Hamilton Health Sciences Centre - General	RSC	Y	Y
Kingston Health Sciences Centre - General	RSC	Y	Y
London Health Sciences Centre - University	RSC	Y	Y
Muskoka Algonquin Healthcare - Huntsville	DSC	Y	
Sunnybrook Health Sciences Centre	RSC	Y	Y
The Ottawa Hospital - Civic	RSC	Y	Y
Thunder Bay Regional Health Sciences Centre	RSC	Y	Y
Trillium Health Partners - Mississauga	RSC	Y	Y
Unity Health Toronto - St. Michael's	RSC	Y	Y
University Health Network - Toronto Western	RSC	Y	Y
Windsor Regional Hospital - Ouellette	DSC	Y	Y