



Regional Paramedic Program  
for Eastern Ontario

# Emergency Stroke Care

*How are we doing?*

Southeast Regional & District  
Acute Stroke Protocol Committee  
June 2022

with thanks to

All 5 Paramedic Services

Regional Paramedic Program of Eastern Ontario  
for Stroke Report

QHC and KHSC



# June is Stroke Month!!

<https://kingstonhsc.ca/khscconnect/news/life-changes-stroke>



Learn the  
signs of stroke

**F**ace is it drooping?

**A**rms can you raise both?

**S**peech is it slurred or jumbled?

**T**ime to call 9-1-1 right away.

Act **F A S T** because the quicker  
you act, the more of the person you save.

© Heart and Stroke Foundation of Canada, 2018

# Ontario Stroke Report FY 2020-21 South East Indicators

RELEASE DATE: JUNE 23 2022



**Ontario Health**  
CorHealth Ontario

# Stroke Care in Ontario 2020/21

## STROKE IS A MEDICAL EMERGENCY



**66%**

of stroke/TIA patients arrived at the emergency department by ambulance

**81%** of patients were referred to secondary prevention services after discharge from the emergency department\*

## TIME IS BRAIN



**14%**

of ischemic stroke patients received hyperacute therapy

**11%** tPA (tissue plasminogen activator) (Target: >12%)

- **44 minutes** median door-to-needle time (Target: <30 minutes)

**6%** EVT (Endovascular therapy)

## STROKE UNIT CARE IMPROVES OUTCOMES



**1.46** per 1000 population

are admitted for acute stroke/TIA

**41** hospitals in Ontario have a stroke unit

**56%** of stroke patients treated on a stroke unit (Target: >75%)

## SECONDARY PREVENTION OF STROKE OCCURS ACROSS THE CARE CONTINUUM

**8 days\*\***

Median time from acute admission to inpatient rehabilitation

## REHABILITATION OPTIMIZES RECOVERY



**31%\*\***

of patients accessed inpatient rehabilitation

- **69 minutes** per day of inpatient therapy was received per patient (Target: 180 minutes)

## STROKE JOURNEY CONTINUES AFTER DISCHARGE



**56 days\*\***

Average number of days spent at home in the first 90 days after stroke

**39%\*\*** received home-based rehabilitation\*

- **9\*\*** median number of visits

**75%** of patients aged 65 and older with atrial fibrillation filled a prescription for anticoagulant therapy within 90 days of acute care discharge\*

## PATIENT OUTCOMES

**7%** of stroke/TIA patients were readmitted within 30 days

**12%** of stroke/TIA patients died within 30 days

**6%\*\*** of stroke patients were admitted to long-term care within 1-year post discharge

\*There is currently no data available for outpatient rehabilitation and secondary prevention clinic.

\*\* 2020/21 Q2 (YTD)



# Stroke Care in South East 2020/21

NOTE: Arrow indicates how SE is trending from last FY report – improvement indicated by upward green arrow; worsening by downward red arrow



## STROKE IS A MEDICAL EMERGENCY



**68.6% ↑** (ON 66.2%)

of stroke/TIA patients arrived at the emergency department by ambulance

**84.0% ↑** (ON 81.4%) of patients were referred to secondary prevention services after discharge from the emergency department\*

## TIME IS BRAIN



**19.9% ↑** (ON 14.1%)

of ischemic stroke patients received hyperacute therapy

**14.8%** tPA (tissue plasminogen activator) (Target: >12%) (ON 10.5%)

**31 minutes** median door-to-needle (ON 44.0) (Target: <30 minutes)

**6.9%** EVT (Endovascular therapy) (ON 5.8%)

## STROKE UNIT CARE IMPROVES OUTCOMES



**1.81 ↑** per 1000 population (ON 1.46)

are admitted for acute stroke/TIA

**41** hospitals in Ontario have a stroke unit

**79.1% ↑** (ON 56.1%) of stroke patients treated on a stroke unit (Target: >75%)

## SECONDARY PREVENTION OF STROKE OCCURS ACROSS THE CARE CONTINUUM

**9 days \*\* ↑** (ON 8.0)

Median time from acute admission to inpatient rehabilitation

## REHABILITATION OPTIMIZES RECOVERY



**26.2% \*\* ↑** (ON 31.4%)

of patients accessed inpatient rehabilitation

**75 minutes** per day of inpatient therapy was received per patient (ON 68.9%) (Target: 180 minutes)

## STROKE JOURNEY CONTINUES AFTER DISCHARGE



**57.2 days \*\* ↑** (ON 56.4)

Average number of days spent at home in the first 90 days after stroke

**66.4% \*\*** received home-based rehabilitation\* (ON 38.6%)  
**12 \*\*** median number of visits (ON 9.0)

**76.6% ↑** (ON 74.9%) of patients aged 65 and older with atrial fibrillation filled a prescription for anticoagulant therapy within 90 days of acute care discharge\*

## PATIENT OUTCOMES – SE rates each similar or improved from last FY

**6.2%** of stroke/TIA patients were readmitted within 30 days (ON 6.6%)

**11.3%** of stroke/TIA patients died within 30 days (ON 12.1%)

**8.2% \*\*** of stroke patients were admitted to long-term care within 1-year post discharge (ON 6.3%)

\*There is currently no data available for outpatient rehabilitation and secondary prevention clinic.  
\*\* 2020/21 Q2 (YTD)

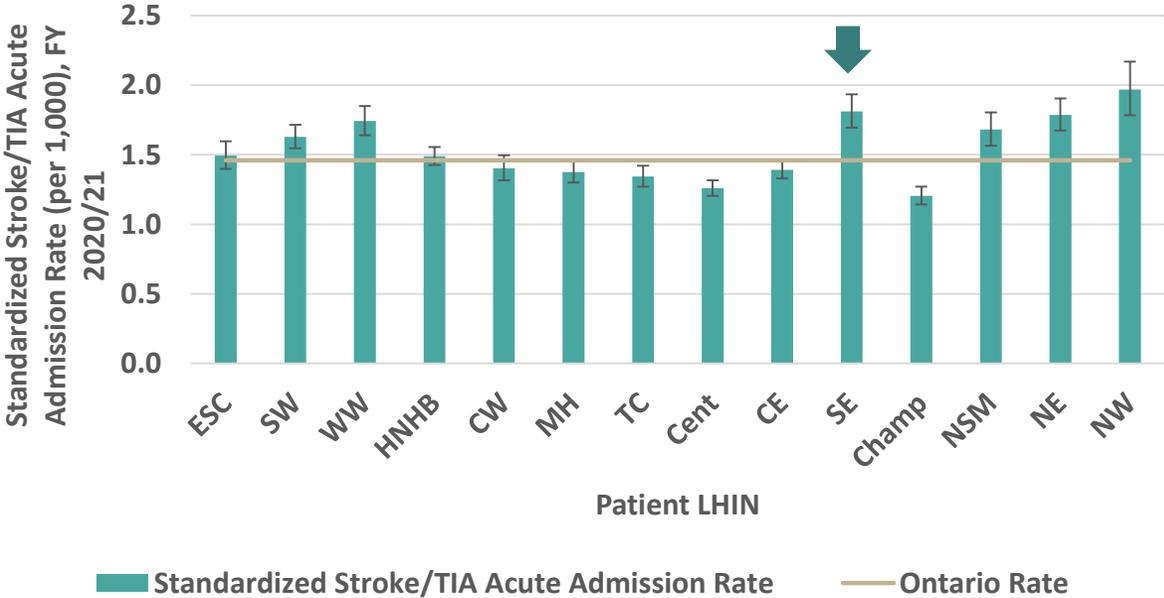
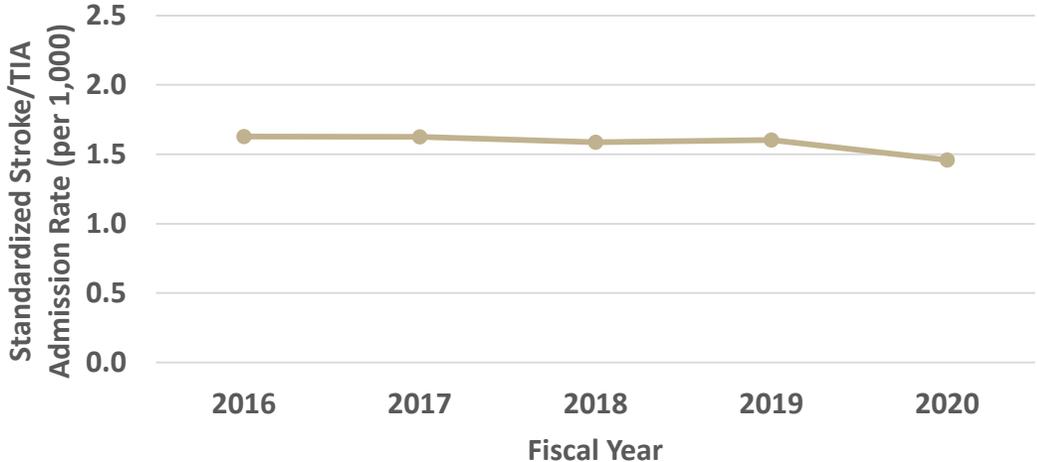


# Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario

## Indicator 1.1: Standardized Stroke and TIA Admission Rate to Acute Inpatient Care (per 1,000), FY 2020/21

### Indicator Description:

The population rate of admission to hospital for stroke & transient ischemic attack (TIA) reflects several factors including the effectiveness of primary and secondary prevention efforts such as control of hypertension and smoking cessation programs. The cohort for this indicator is the Ontario adult population in the Registered Persons Database (RPDB). Ontario and LHIN performance are directly standardized to the 2020 RPDB population age and sex profile.



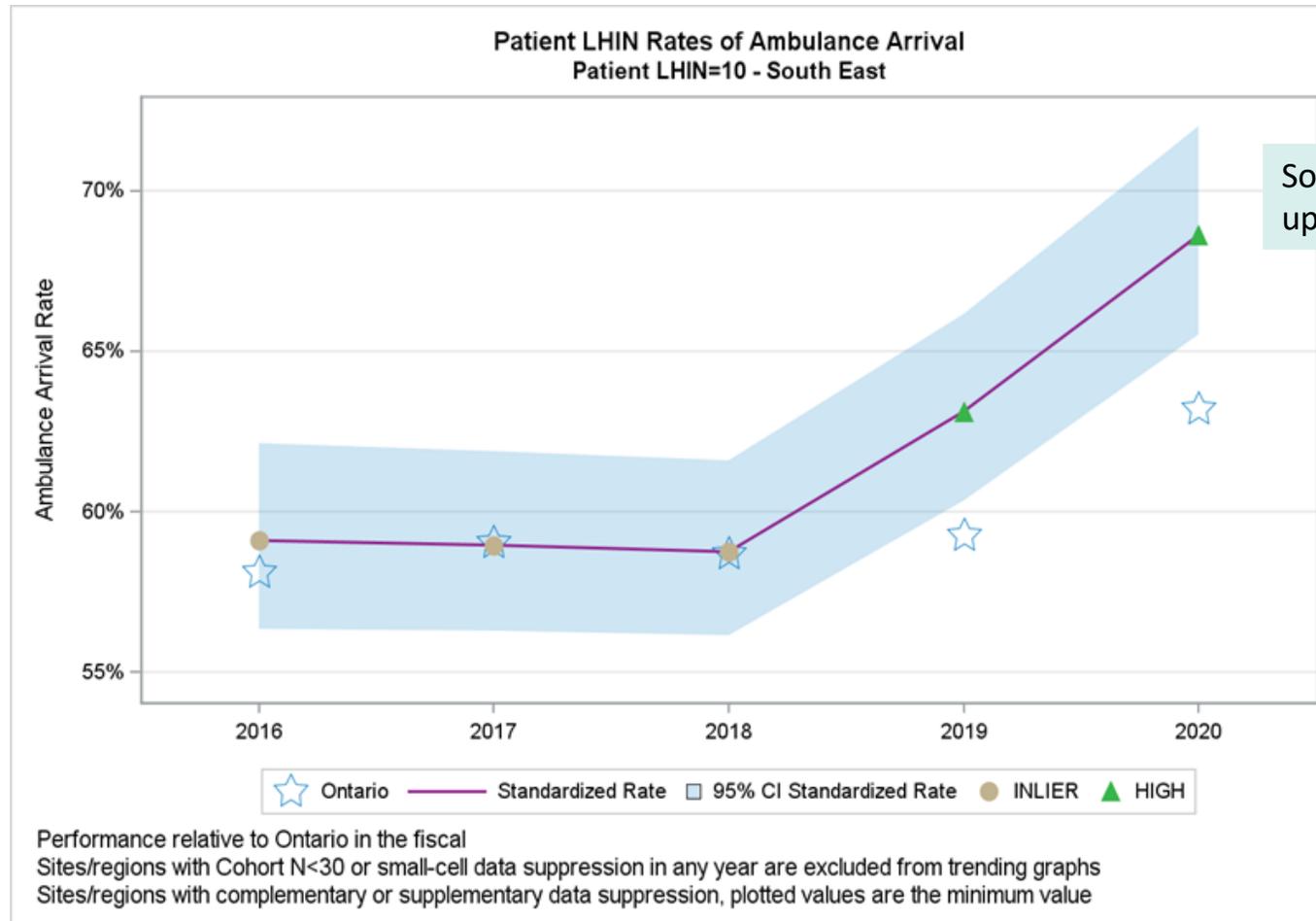
### Interpretation Consideration:

Desired directionality is lower. There was very little movement in the Ontario rate between fiscal years 2016 to 2019, however in fiscal year 2020, there was a noticeable decrease. During the early stages in the pandemic, the number of ED visits for stroke decreased<sup>4</sup>, which may account for some of the decrease in admissions for stroke. Only the first (index) stroke in each fiscal year is included. Factors that may contribute to the LHIN variation observed may be reflective of geographic nuances with respect to social determinants health and health resource equity.

# Common symbols and their meaning

Symbols	Interpretation
◀ West ● Central ▶ Toronto ▶ East ▲ North	The LHIN is a member of the LHIN cluster, aka Super-LHIN
▲	The region or provider is statistically above Ontario performance and high values are preferred
▲	The region or provider is statistically above Ontario performance and low values are preferred
▼	The region or provider is statistically below Ontario performance and high values are preferred
▼	The region or provider is statistically below Ontario performance and low values are preferred
●	The region or provider is within a 95% confidence interval of Ontario performance
△ ABC High    ▽ ABC Low	High and low achievable benchmarks for indicators in which a large value is preferred
△ ABC High    ▽ ABC Low	High and low achievable benchmarks for indicators in which a low value is preferred
☆ Ontario	Ontario performance in a given fiscal year
Rate	Unless specified otherwise, all rates are per 100 cohort patients
Fiscal Year	Calendar year of the beginning of a fiscal year (for example, 2018 is 2018/19)

## 1-5 Standardized Ambulance arrival rate for stroke and TIA visits to the Emergency Department - FY 2020-21



Patient Subregion Rates of Ambulance Arrival  
Patient LHIN=10 Patient Subregion=1004-Kingston

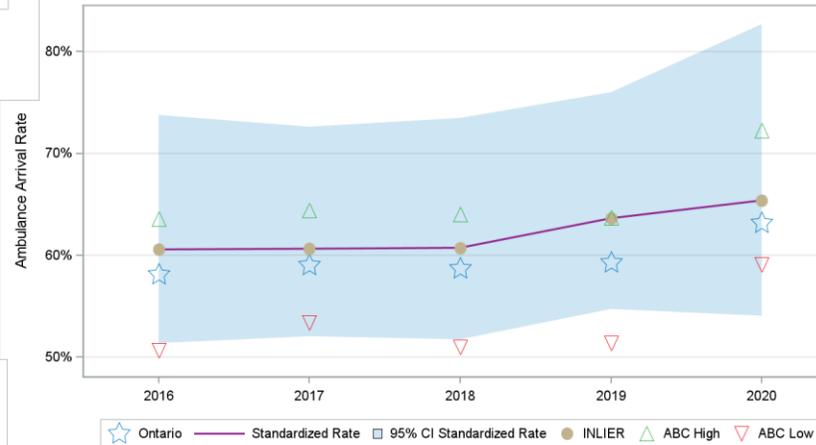


Benchmark is achieved performance in the fiscal  
Performance relative to Ontario in the fiscal  
Sites/regions with Cohort N<30 or small-cell data suppression in any year are excluded from trending graphs  
Sites/regions with complementary or supplementary data suppression, plotted values are the minimum value

Kingston

# 1-5 Standardized Ambulance Arrival Rate by Sub Region

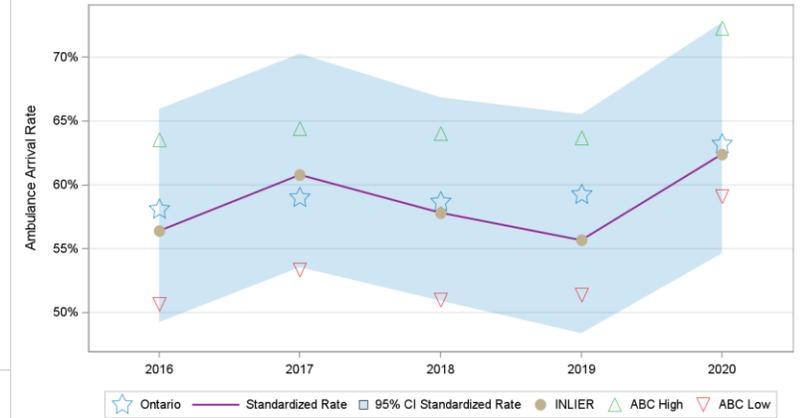
Patient Subregion Rates of Ambulance Arrival  
Patient LHIN=10 Patient Subregion=1001-Rural Hastings



Benchmark is achieved performance in the fiscal  
Performance relative to Ontario in the fiscal  
Sites/regions with Cohort N<30 or small-cell data suppression in any year are excluded from trending graphs  
Sites/regions with complementary or supplementary data suppression, plotted values are the minimum value

Rural Hastings

Patient Subregion Rates of Ambulance Arrival  
Patient LHIN=10 Patient Subregion=1003-Rural Frontenac, Lennox & Addington

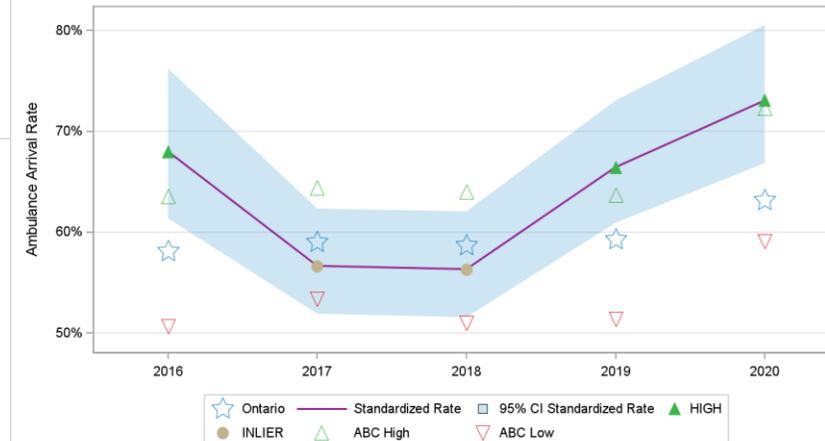


Benchmark is achieved performance in the fiscal  
Performance relative to Ontario in the fiscal  
Sites/regions with Cohort N<30 or small-cell data suppression in any year are excluded from trending graphs  
Sites/regions with complementary or supplementary data suppression, plotted values are the minimum value

Rural FLA

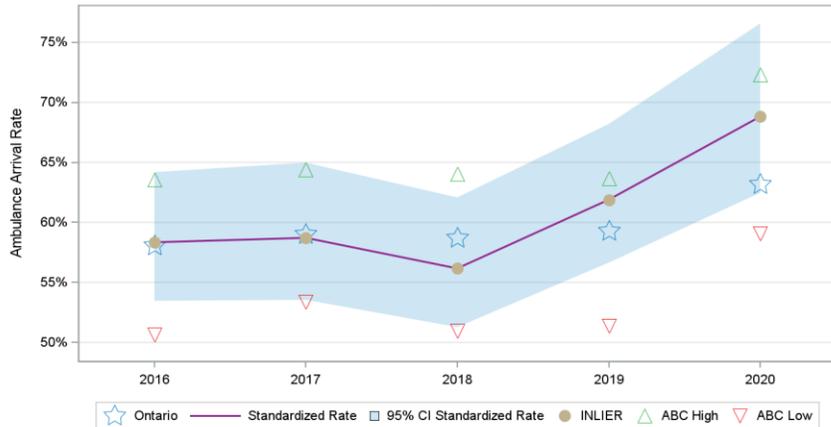
Quinte

Patient Subregion Rates of Ambulance Arrival  
Patient LHIN=10 Patient Subregion=1002-Quinte



Benchmark is achieved performance in the fiscal  
Performance relative to Ontario in the fiscal  
Sites/regions with Cohort N<30 or small-cell data suppression in any year are excluded from trending graphs  
Sites/regions with complementary or supplementary data suppression, plotted values are the minimum value

Patient Subregion Rates of Ambulance Arrival  
Patient LHIN=10 Patient Subregion=1005-Lanark, Leeds & Grenville



Benchmark is achieved performance in the fiscal  
Performance relative to Ontario in the fiscal  
Sites/regions with Cohort N<30 or small-cell data suppression in any year are excluded from trending graphs  
Sites/regions with complementary or supplementary data suppression, plotted values are the minimum value

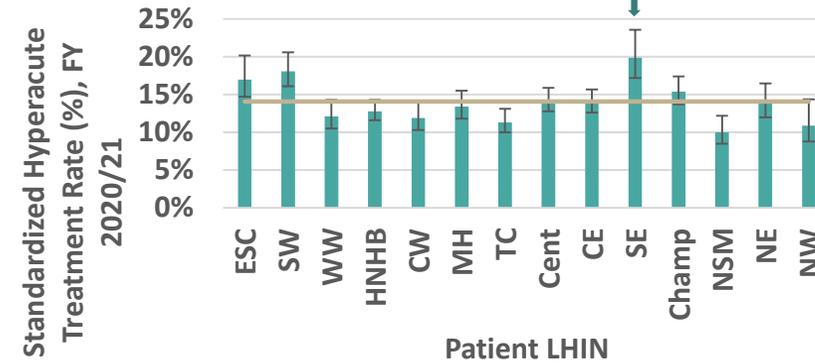
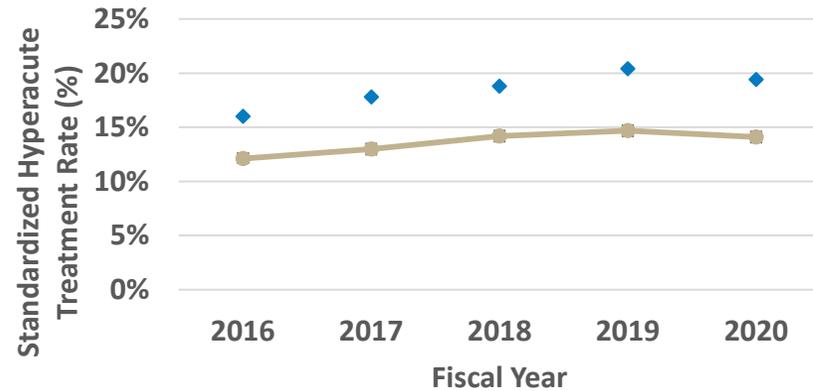
LL&G

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

## Indicator 2.1.1: Standardized Hyperacute Treatment Rate (tPA and/or EVT), FY 2020/21

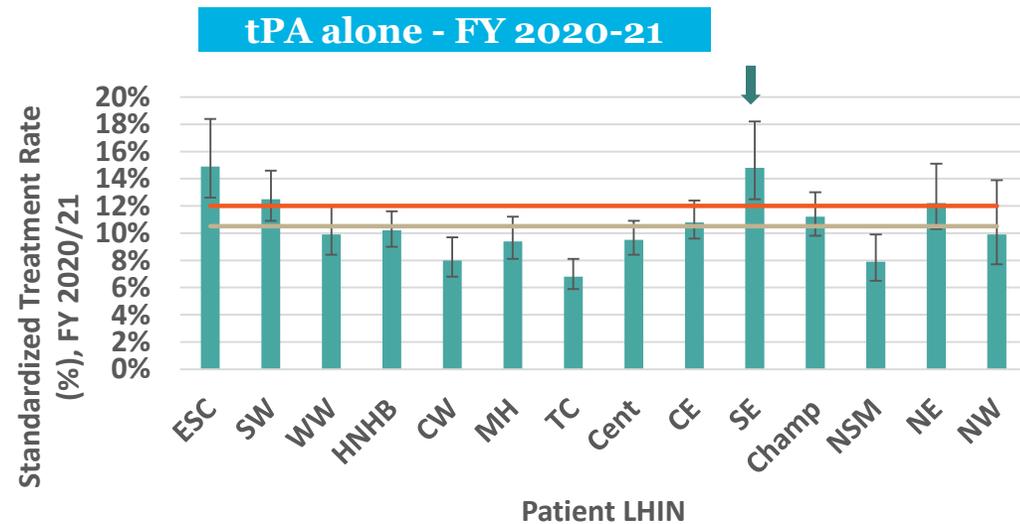
### Indicator Description:

This indicator measures the rate of ischemic stroke patients who received hyperacute therapy which includes endovascular thrombectomy (EVT) and/or tissue plasminogen activator (tPA). The indicator is standardized for type II stroke diagnosis (i.e., in-hospital stroke) and whether ischemic stroke was the MRDx.

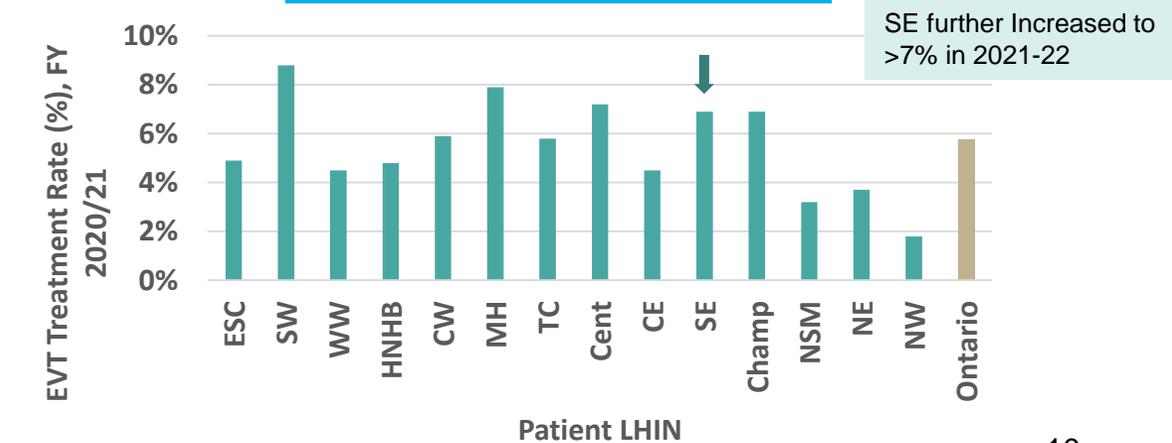


— Hyperacute Treatment Rate    ◆ Provincial Benchmark

█ Hyperacute Treatment Rate    — Ontario Rate



### EVT alone - FY 2020-21



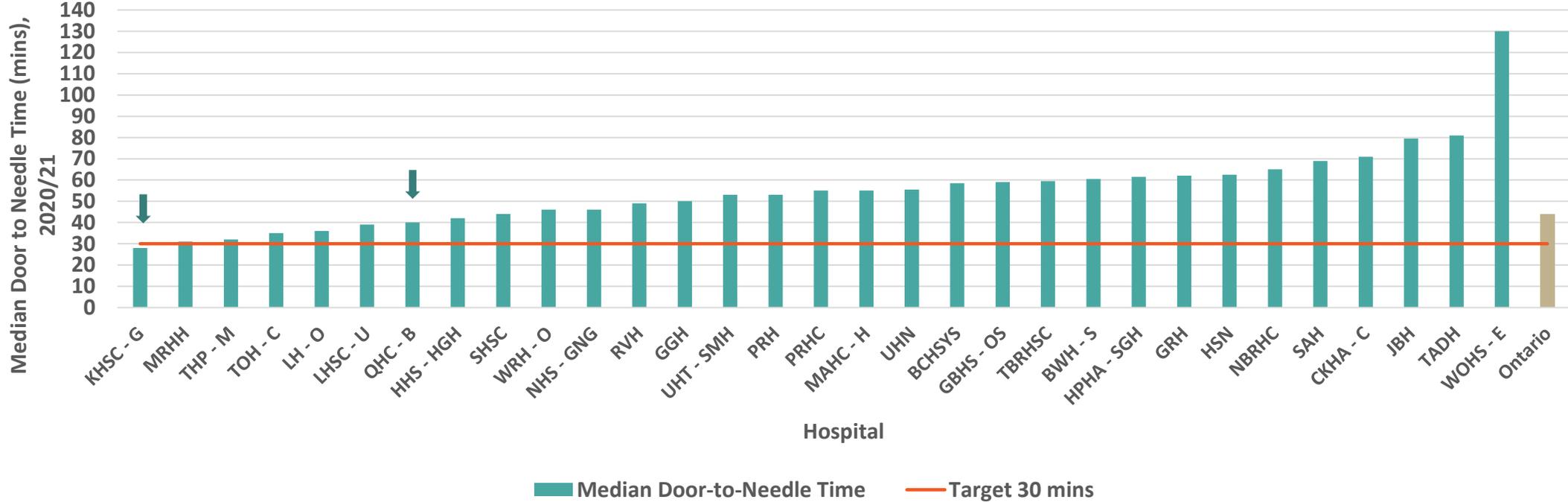
█ tPA Treatment Rate    — Ontario Rate    — Target >12%

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

## Indicator 2.2: Median Door-to-Needle Time for tPA Treatment (mins), FY 2020/21 – Hospital Level

### Indicator Description:

The time, in minutes, between a stroke patient’s emergency department (ED) door time and the time thrombolysis with tissue plasminogen activator (tPA) was administered is referred to as door-to-needle (DTN) time. The target median door to needle time is 30 minutes.<sup>3</sup>



### Interpretation Consideration:

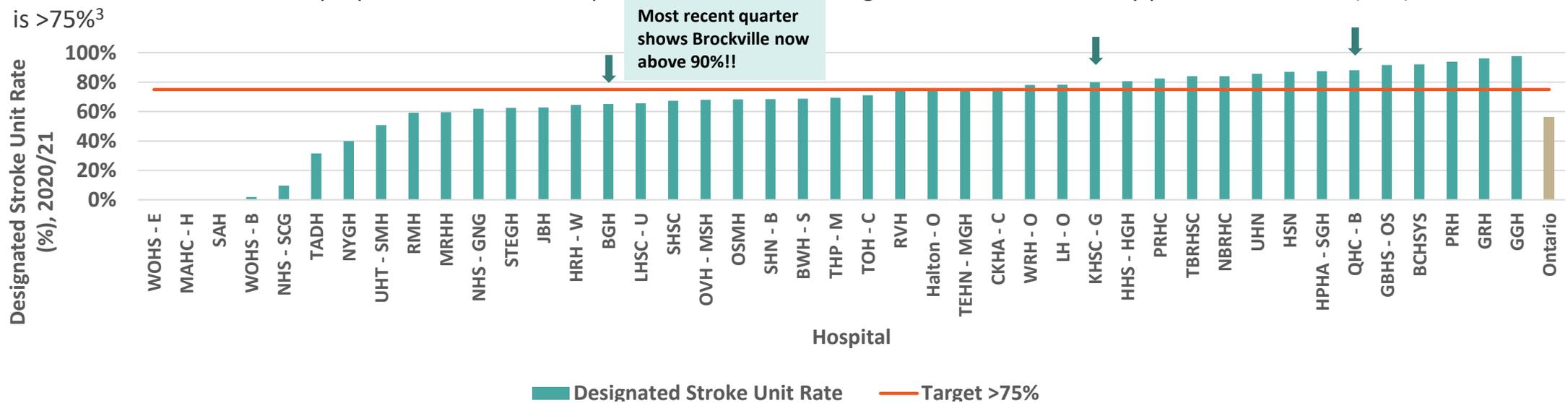
Desired directionality is lower. Start of the ED door time is defined as ED triage or ED registration time (whichever comes first). KHSC-G was the only hospital that achieved target time. Median door-to-needle time ranges from 28 minutes (KHSC-G) to 130 minutes (WOHS-E). Hospitals should be reviewing their processes of care to drive quality improvement on access to this time dependent treatment. Refer to [Appendix B](#) for hospital abbreviations.

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

### Indicator 3.1: Designated Stroke Unit Rate for Stroke/TIA Acute Patients, FY 2020/21 – Hospital Level

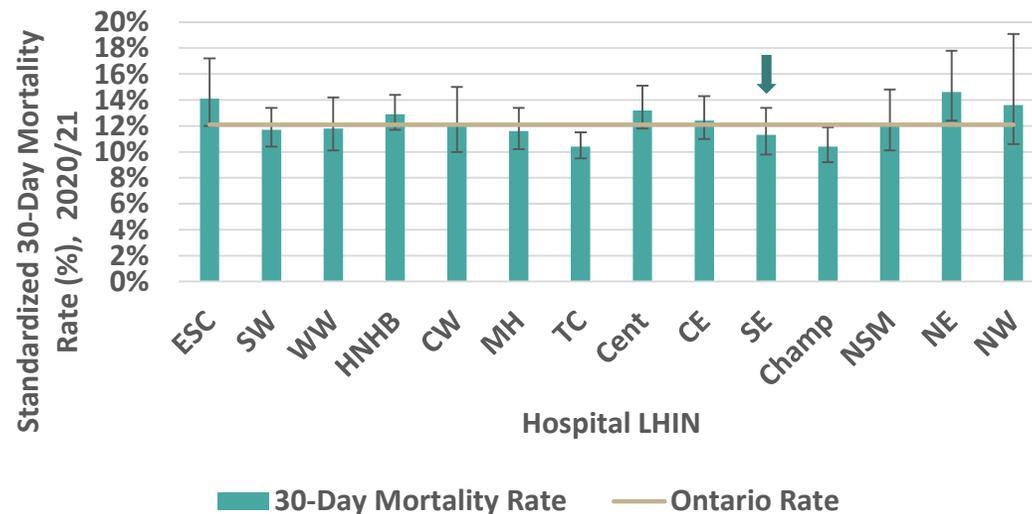
#### Indicator Description:

This indicator measures the proportion of stroke/TIA patients treated in a designated stroke unit for any part of their index (first) admission. Target is >75%<sup>3</sup>



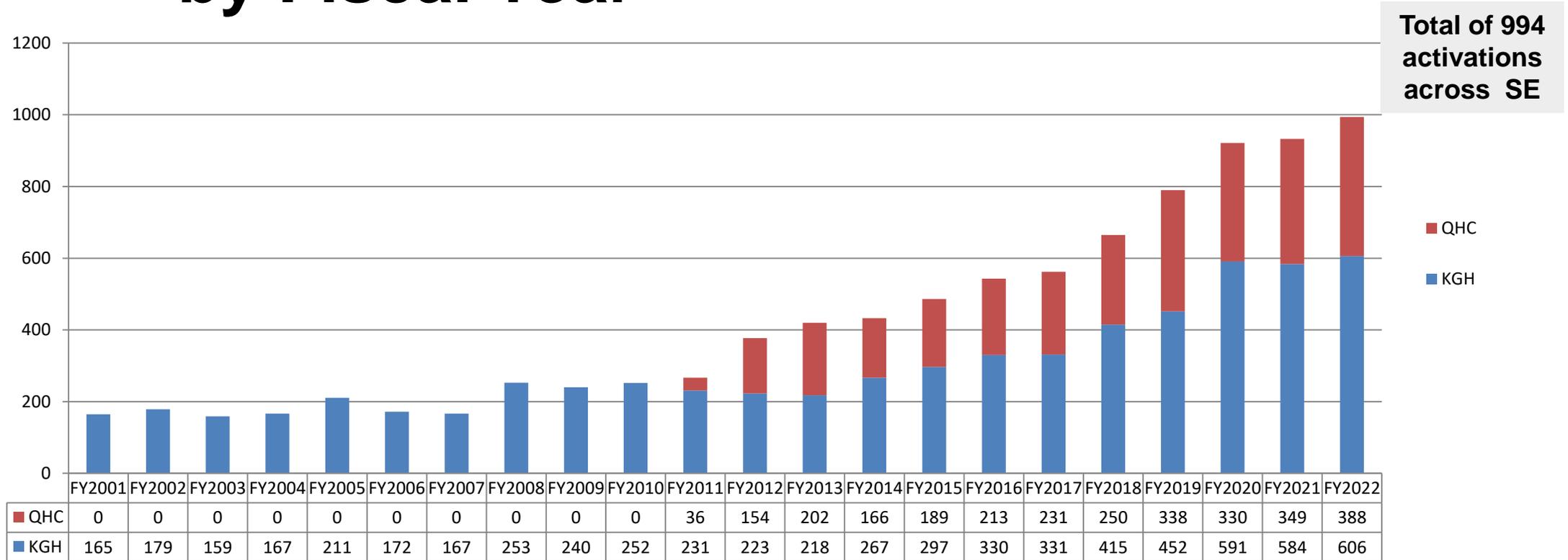
## Chapter 3: Acute Care Access and Outcomes for Stroke and TIA

### Indicator 3.3: Standardized 30-Day All-Cause Mortality Rate of Stroke and TIA Admissions to Acute Care, FY 2020/21



Lower mortality is associated with ≥75% Stroke Unit utilization. Efforts continue to sustain Stroke Unit utilization.

# SEO ASP Activations KHSC/QHC by Fiscal Year



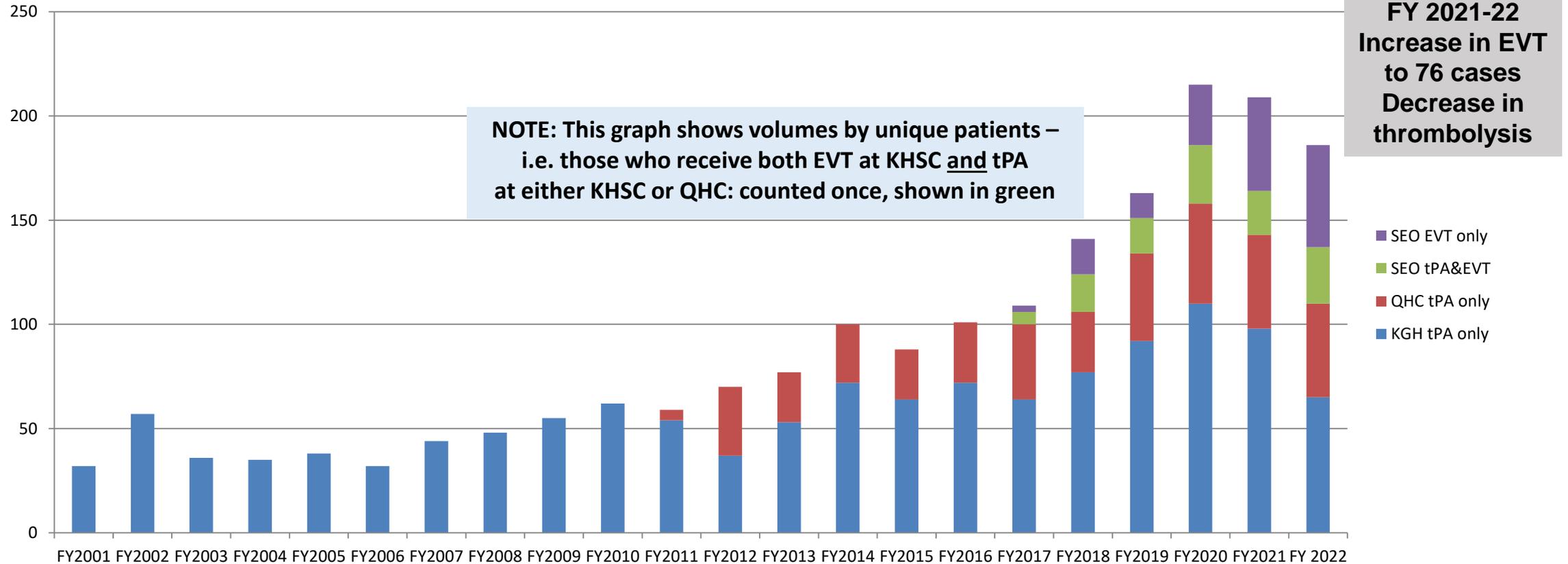
**2021- 22 – 994 stroke protocol activations at QHC and KHSC**

**Includes 118 In-hospital stroke protocol activations**

**Note re In-hospital activations:**

- similar to last year at 121 but up from 2019-20 at 78
- 85 at KGH – 7 treated (1 tPA + 6 EVT); 33 at QHC – 7 tPA

# KHSC/QHC tPA and EVT Volumes by Fiscal Year – unique patients



**Growth in EVT rates; *RAPID* imaging contributes to patient selection**

**Median Door-to Needle (DTN) times:**

**2021-2022 KGH 27 mins; QHC 44 mins and still improving**

**Key factors: pre-notification; stay on paramedic stretcher to CT; tPA in CT suite**



# Regional Paramedic Program for Eastern Ontario Stroke Report - Calendar Year 2021

with thanks to

Base Hospital Program, The Ottawa Hospital

Bill Hughes, Quality Reviewer

Yiping Ma, Analyst

James Bowen, EMS Coordinator

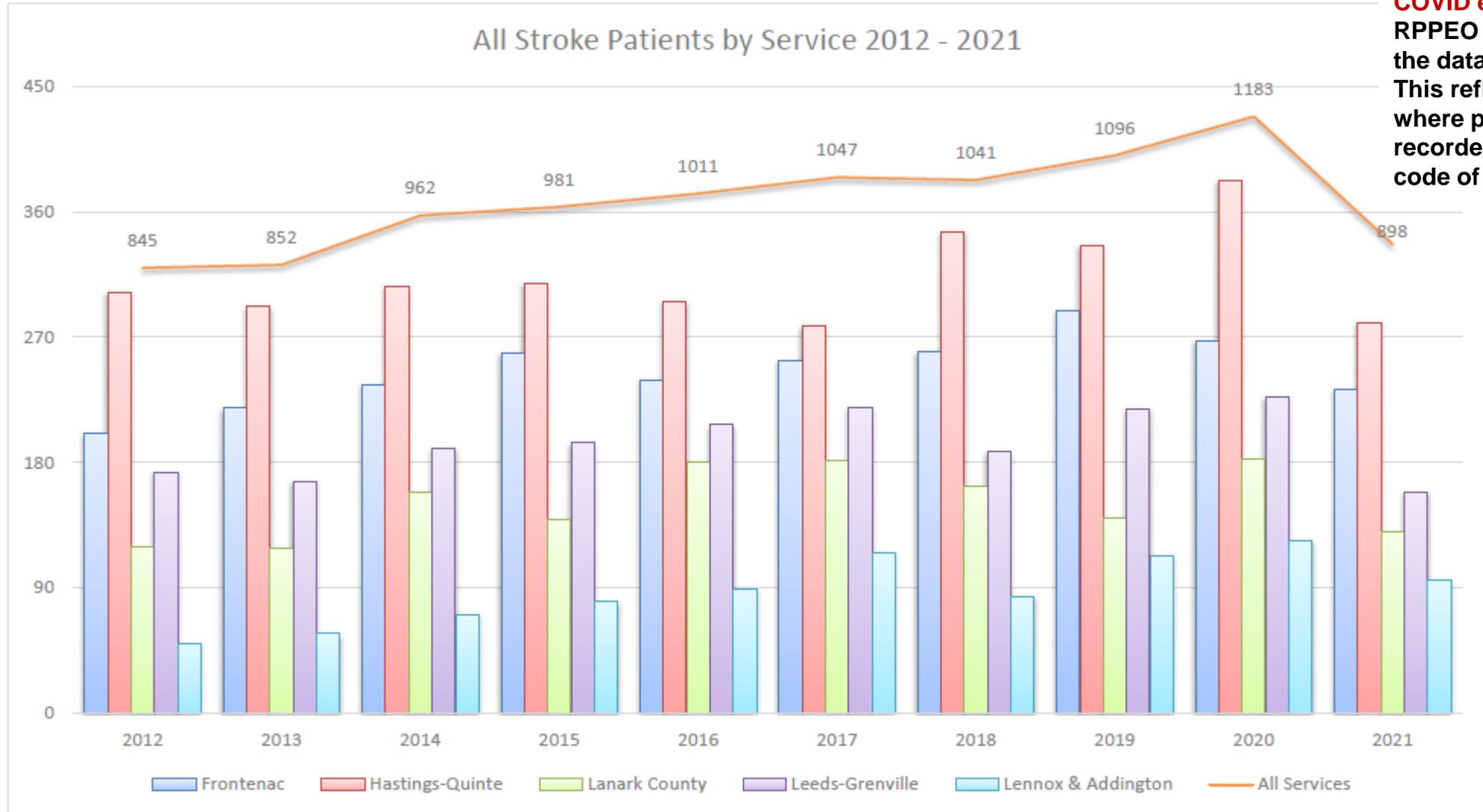
Benjamin de Mendonca, Manager, Quality & Patient Safety

and

All Paramedic Services

# All Stroke Patients by Paramedic Service x 10 yrs

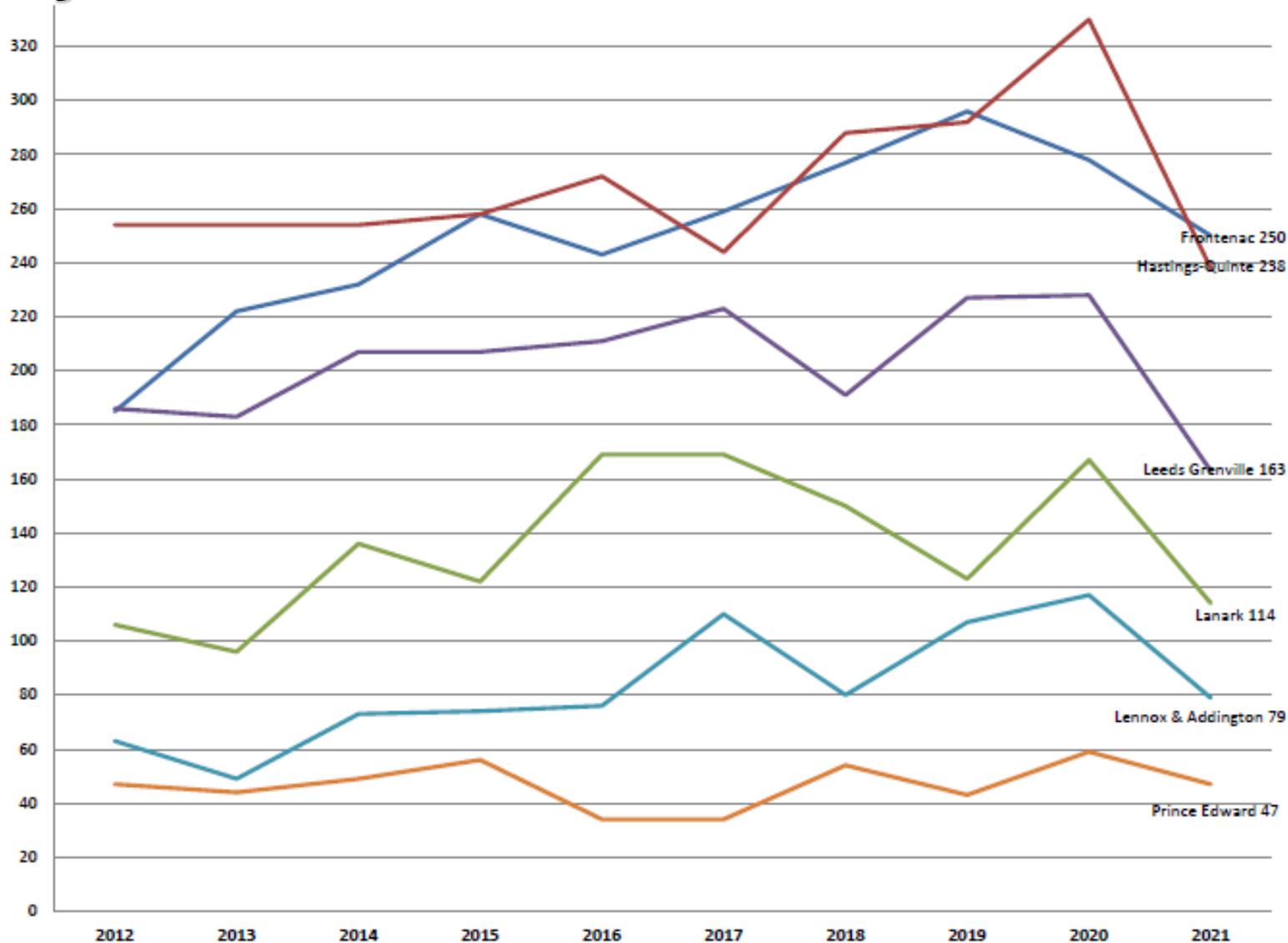
Data Source: RPPEO Stroke Report CY 2021



Decrease could be COVID effect?  
 RPPEO is looking into the data anomaly.  
 This reflects those where paramedic recorded problem code of stroke/TIA.

# ALL Stroke Calls by Local Area over past 10 years

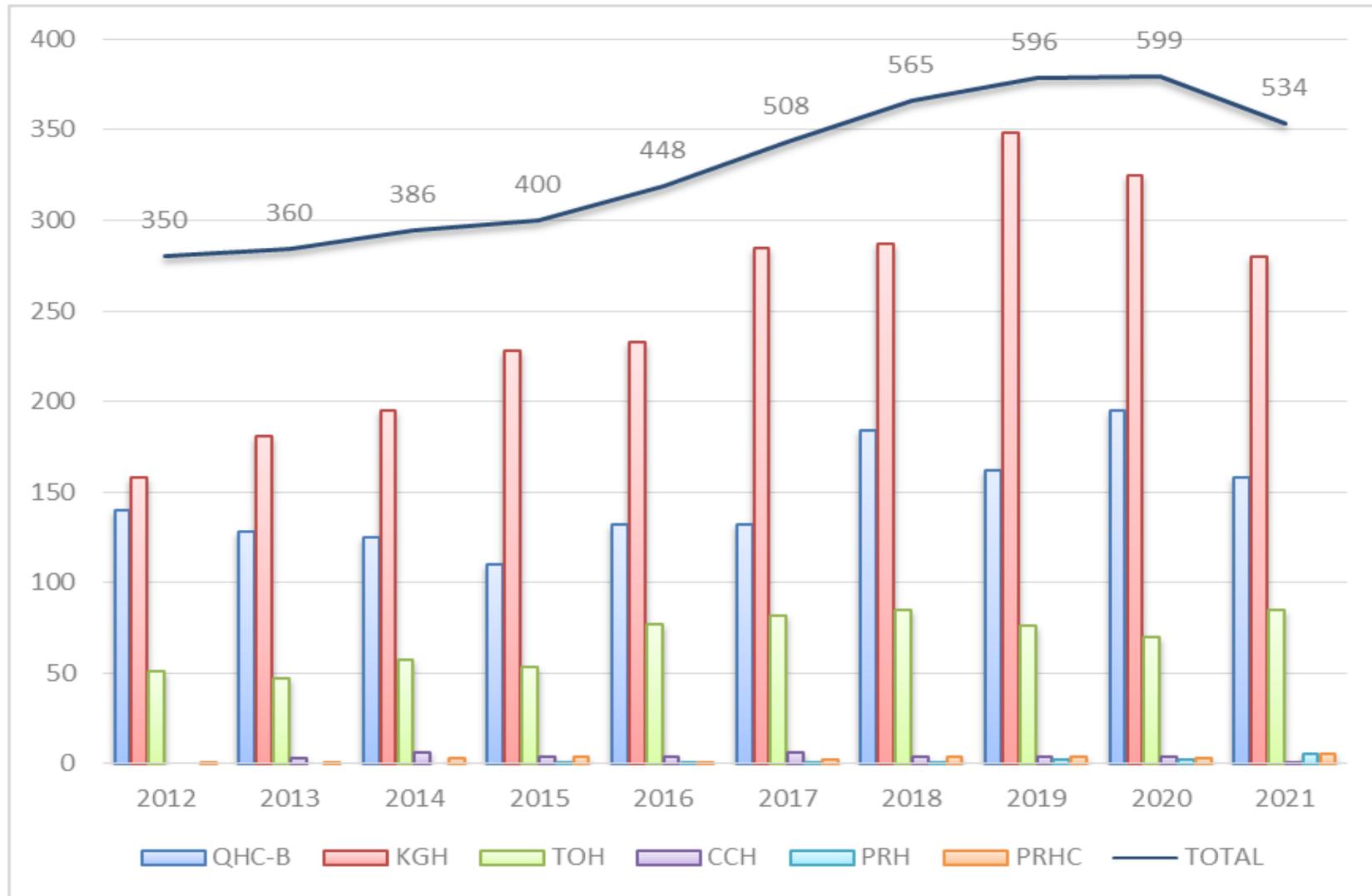
Data Source: RPPEO CY2021 Stroke Report



COVID effect  
in CY 2021?

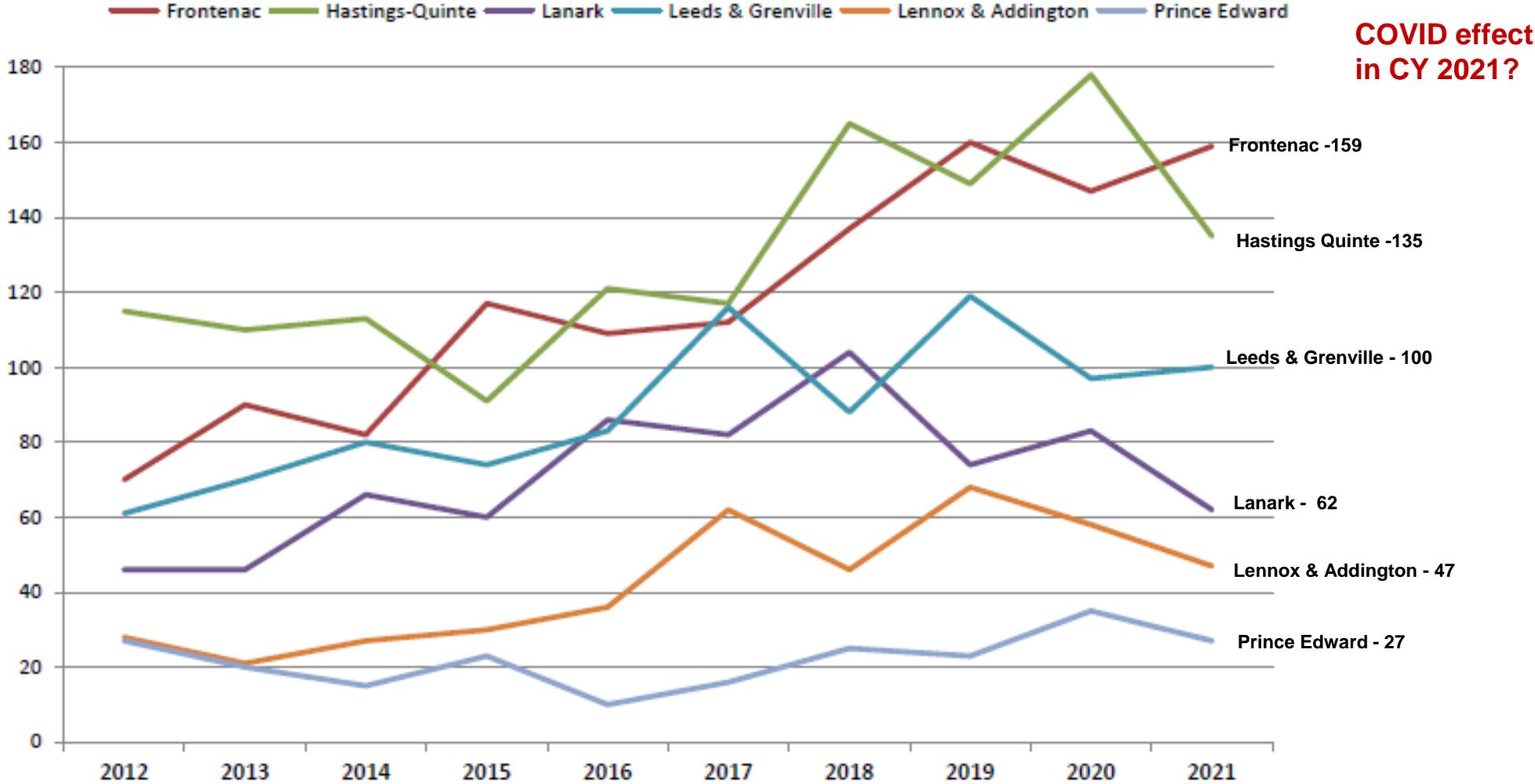
# ASP Stroke Protocol Patients by Paramedic Service x 10 yrs

Data Source: RPPEO Stroke Report CY 2021



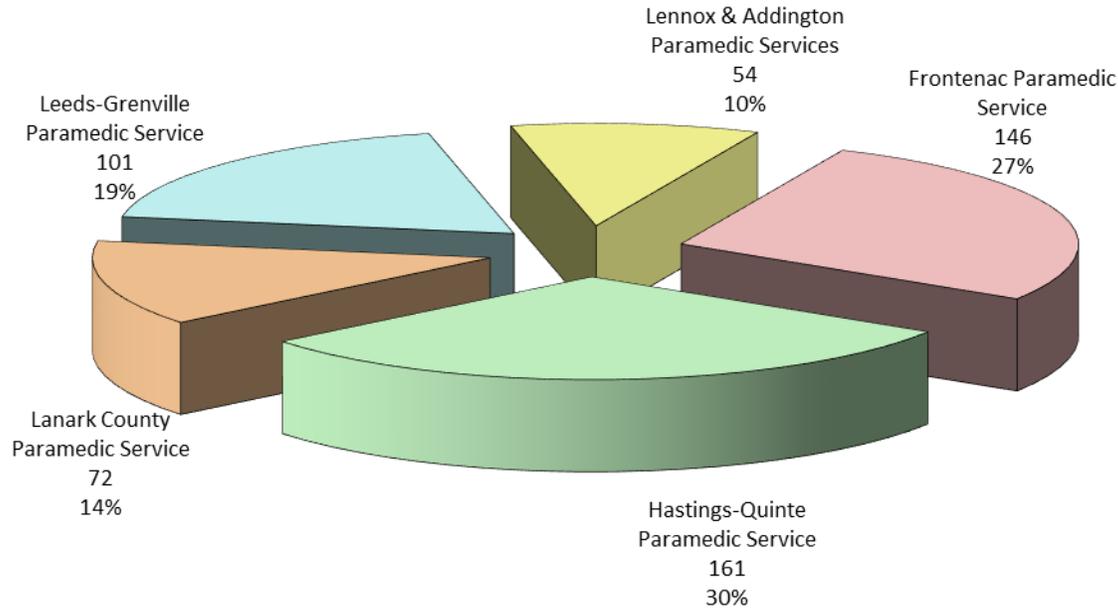
# Stroke Protocol Calls by Area

over past 10 years Data Source: RPPEO CY2021 Stroke Report



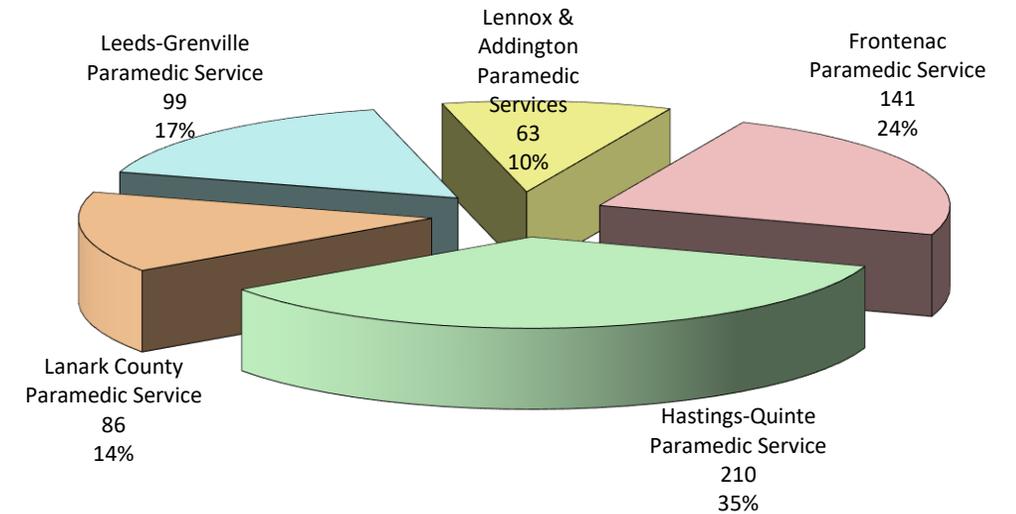
**ACUTE STROKE PROTOCOL (ASP) PATIENTS IN 2021 (N=534)  
BY RESPONDING PARAMEDIC SERVICE**

Data Source: RPPEO 2021 Stroke Report



**2021  
ASP stroke calls  
by service  
N=534**

**2020  
ASP stroke calls  
by service  
N=599**



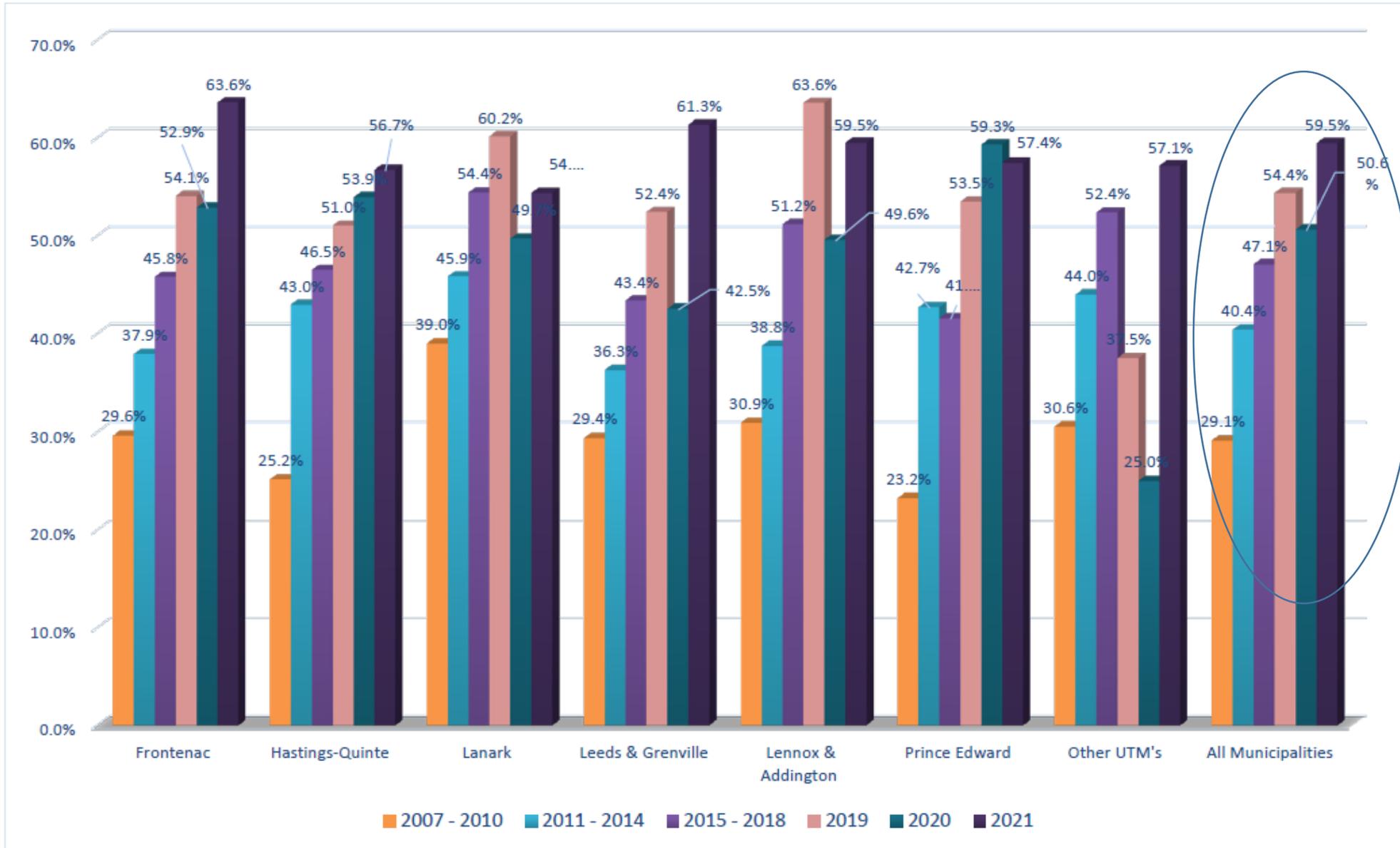
## CONTRAINDICATIONS FOR PATIENT TRANSPORT UNDER THE ACUTE STROKE PROTOCOL

Of the total patients identified as suffering from a stroke or TIA from January 1, 2021 to December 31, 2021, 364 were excluded from the Acute Stroke Protocol because of the following reasons:

Unable to determine when patient last seen normal	83
Unable to deliver patient to stroke centre within timeline	121
6 - 12 hours	57
12 - 24 hours	48
greater than 24 hours	16
Patient was unconscious or unstable	14
Terminally ill or palliative care patient	2
Seizure at onset of symptoms	9
Symptoms resolved prior to paramedic departing scene	122
Symptoms mild	2
Patient refused	0
Should have been	11
<b>Total</b>	<b>364</b>

# % STROKE PATIENTS TRANSPORTED IN EACH COUNTY WHO MET ACUTE STROKE PROTOCOL

Data Source: RPPEO 2021 Stroke Report





# Ontario Telestroke Report 2020-21 South East Indicators

Released 2022



# Chapter 2: Treatment

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

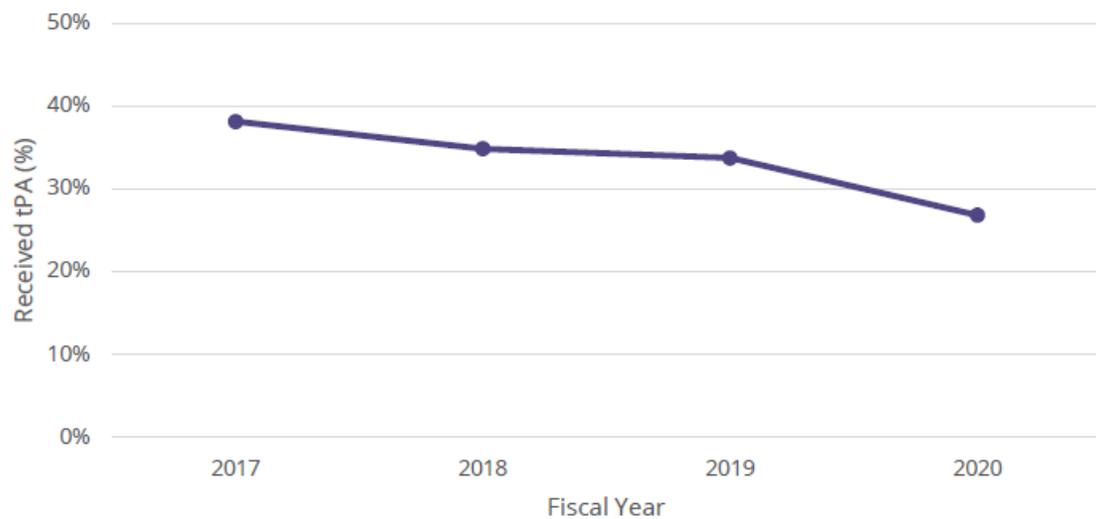
### Indicator Description:

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

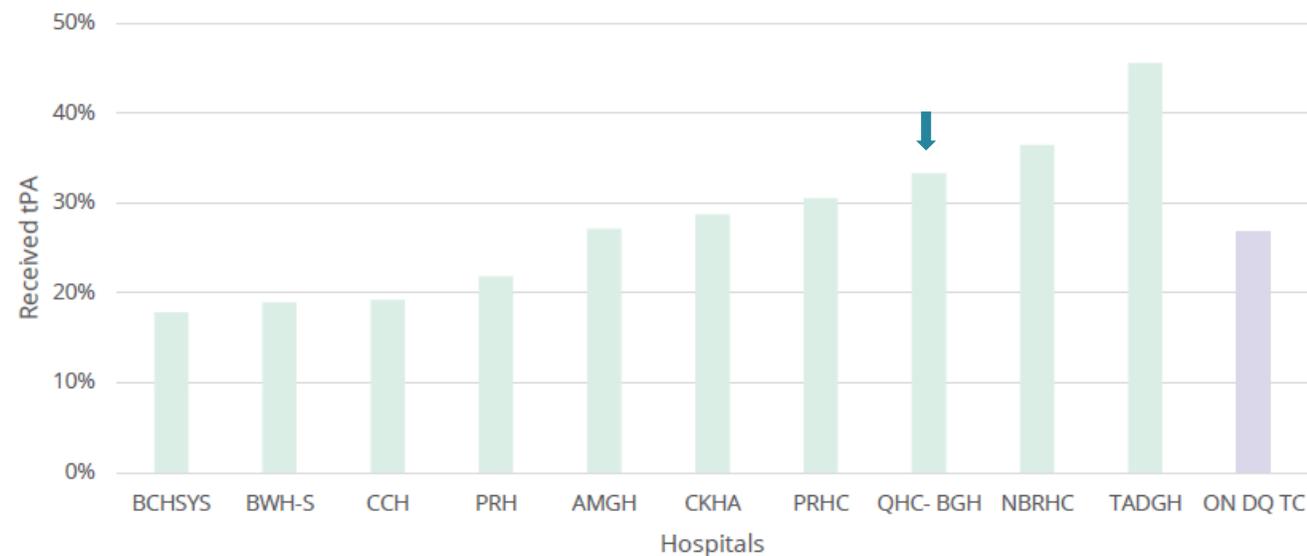


### Site Level Results (FY 2020/21)

Chart Notes: DRHC, HNDH, MH, RHCF, SGH, SLMYW 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 SP 640 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 last 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)

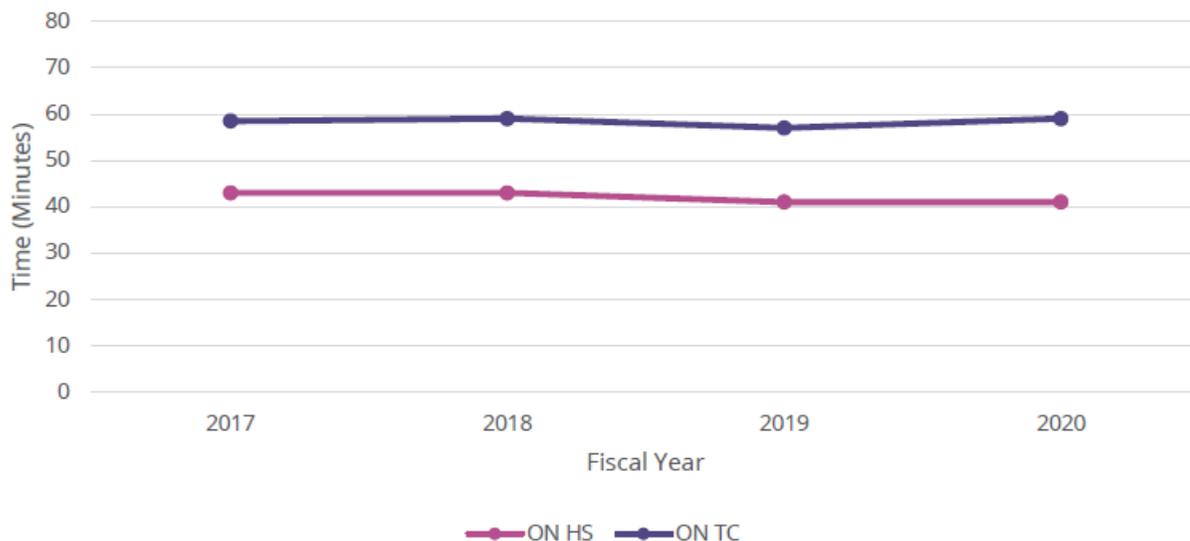
### Indicator Description:

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.

### Ontario Telestroke Consults and Ontario Hyperacute Sites

Data Source: CIHI DAD/NACRS

Glossary: ON TC- Ontario Telestroke Consults from Sites Meeting DQ Cut Off | ON HS- Ontario Non-Telestroke Hyperacute Sites

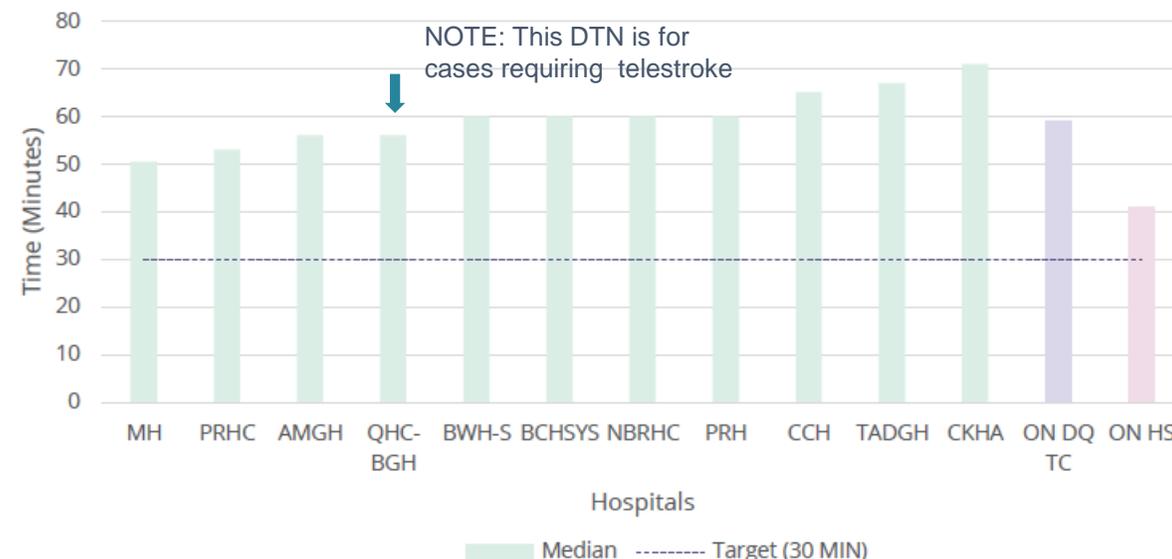


### Site Level Results (FY 2020/21)

Chart Notes: DRHC, HNDH, RHC, SGH are not included due to case counts between 1-5

Data Source: CIHI DAD/NACRS

Glossary: ON TS- Ontario Telestroke Consults From Sites Meeting DQ Cut Off | ON HS- Ontario Non-Telestroke Hyperacute Sites



### Interpretation Considerations

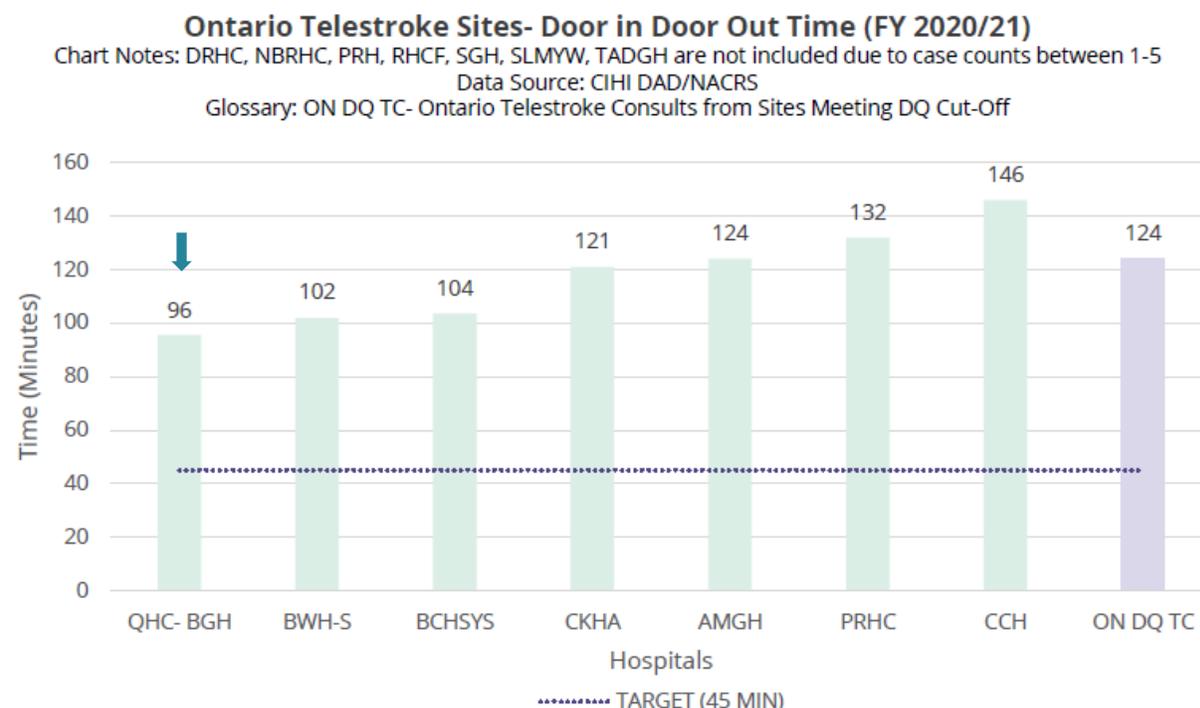
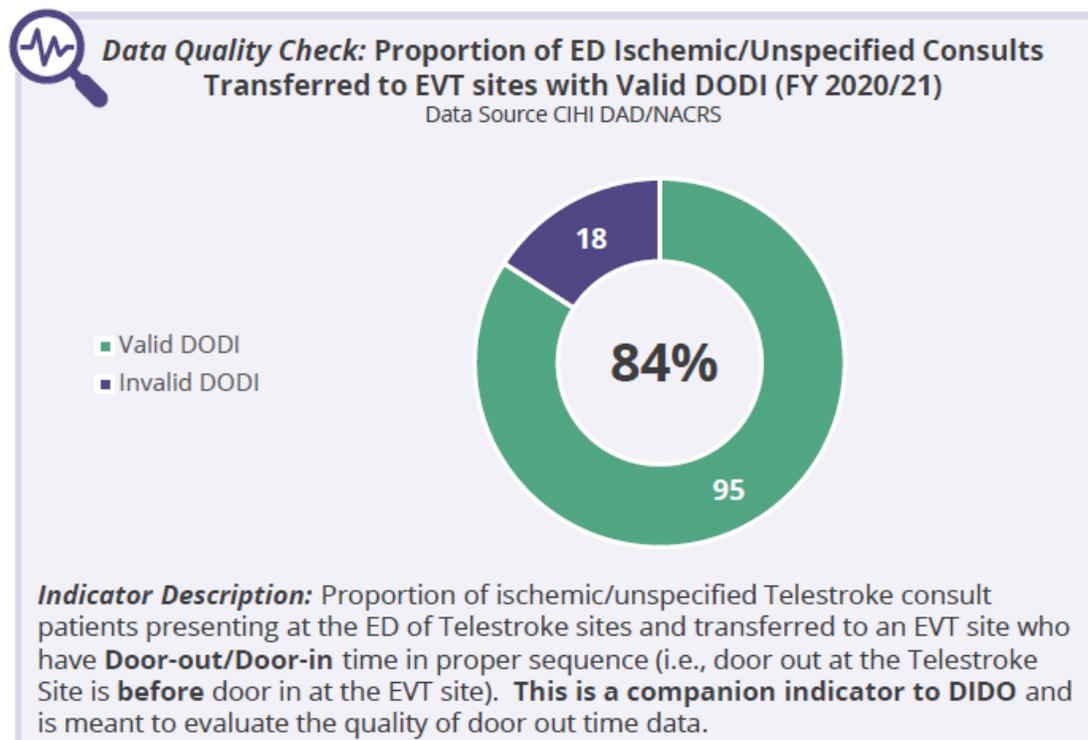
- Only sites that achieved  $\geq 60.0\%$  for the DQI 1: *Ratio of Unique Telestroke Consult Patients Based on SP 640 and CritiCall* have been included in the provincial results and data visualizations
- For this indicator, a lower value is desired; the target of 30 minutes has been adopted from the Canadian Stroke Best Practice Recommendations.
- 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 hospitals 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 2.5: Door in Door Out (DIDO) Time (Minutes)

### Indicator Description:

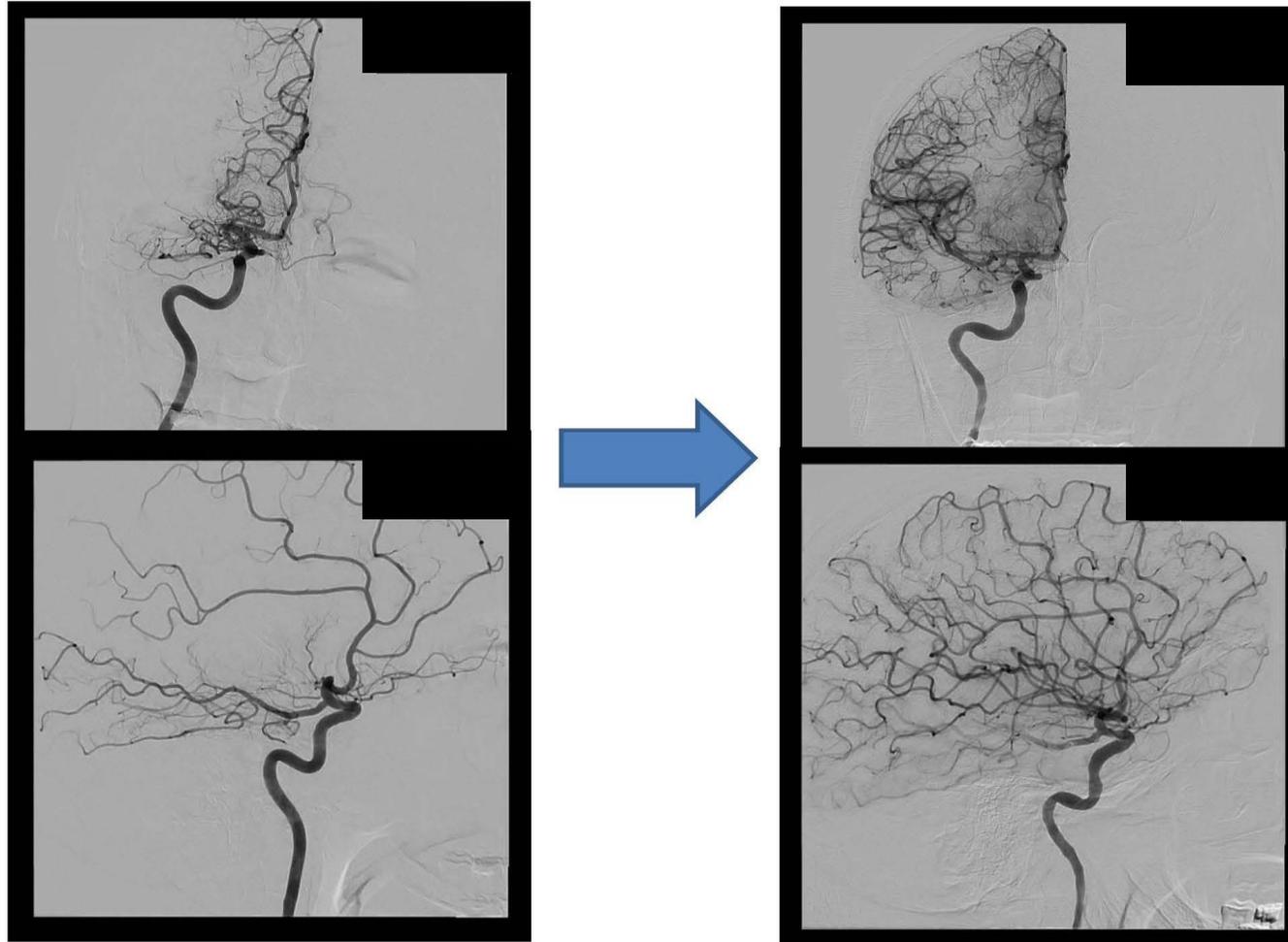
This indicator reports the median time, in minutes, between the entry time and discharge time in the emergency department (ED) at a Telestroke site among ischemic/unspecified Telestroke consult patients transferred to an EVT site.



### Interpretation Considerations

- Only sites that achieved  $\geq 60.0\%$  for the DQI 1: *Ratio of Unique Telestroke Consult Patients Based on SP 640 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.
- Rapid door in door out times are 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 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.
- There has been a slight methodological change to this indicator. Please refer to the Appendix or Technical Specifications document for details.

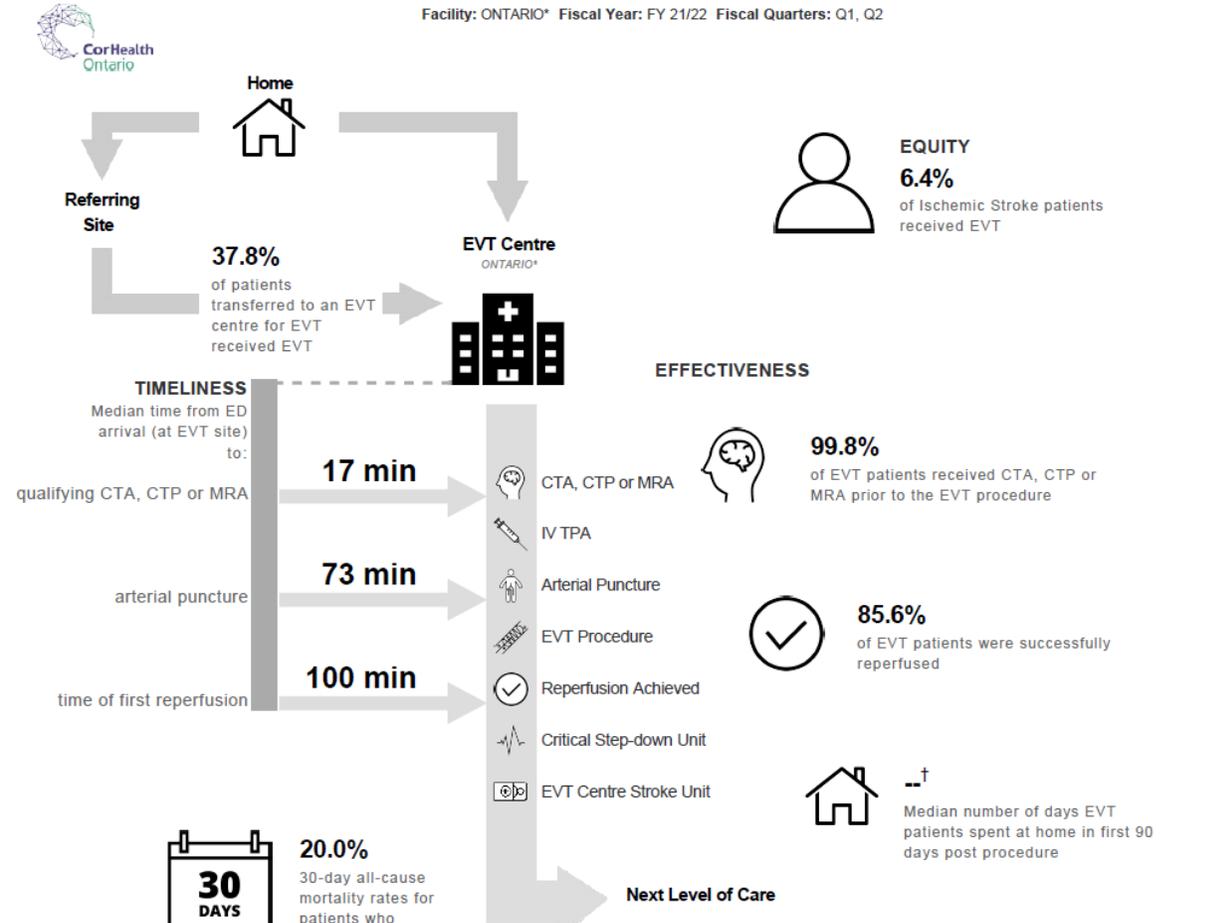
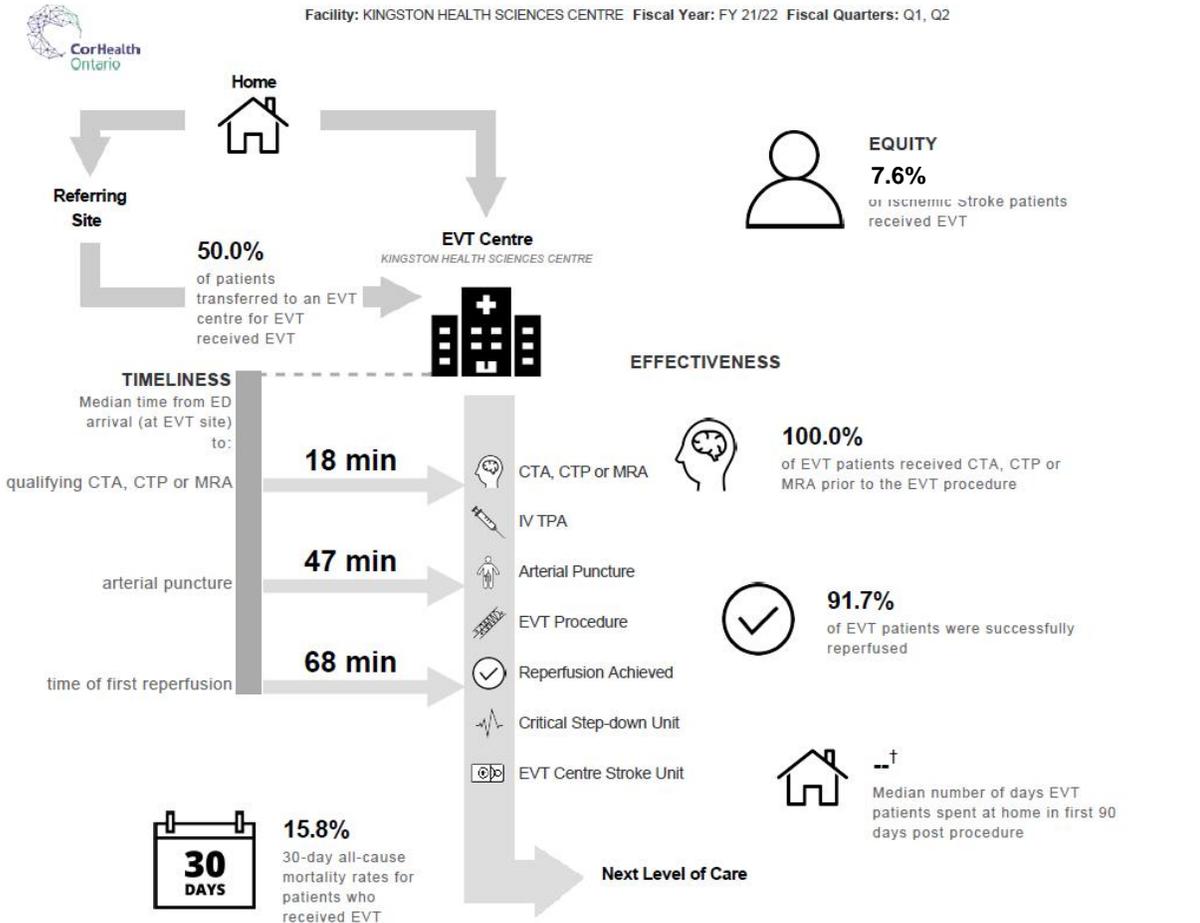
# KHSC EVT Current Outcomes



# CorHealth Ontario EVT Report FY 2021-22 – Q1, Q2 (April to Sept)

## Kingston

## Ontario



# KHSC EVT Current Outcomes

**Target\*:** 46% with 90 day Modified Rankin Scale (MRS) score of  $\leq 2$  (minimal to no disability)

\*based on Hermes Meta-Analysis

Over 250 anterior and 15 posterior cases to March 31, 2022

Most recent analysis FY 2021-22 :

72 anterior, 4 posterior circulation cases completed

- ongoing growth from last fiscal
- Geographic distribution: HPE – 24; KFLA – 32 (5 from L&A); LLG – 18; 2 out of region
- 36 female/40 male

For the 71 anterior cases – using Best MRS score – **some still improving**

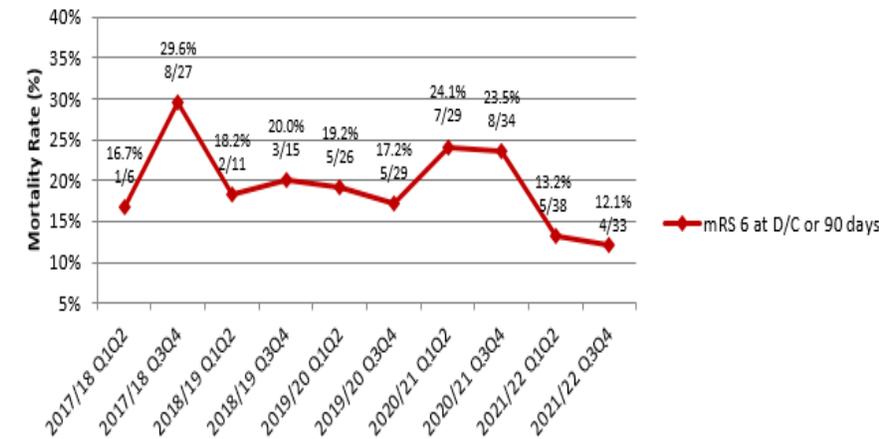
- 31/71 (43.7%) with minimal to no disability MRS  $\leq 2$
- 22/71 (31%) with moderate disability
- 9/71 (12.7%) with severe disability
- 9/71 (12.7%) mortality

Times: 13 min D to CT; 23 min DTN; 39 min D to Groin puncture, 57 min D to Reperfusion

27 cases treated between 6 and 24 hours in FY 2021-22

- 24 Anterior cases & 3 Post cases: HPE - 10; KFLA - 8 (4 L&A); LLG – 8; 1 other region
- Disability Outcomes:
  - 12/27 (44.4%) minimal to no disability
  - 8/27 (29.6%) moderate disability
  - 1/27 (3.7%) severe disability
  - 6/27 (22.2%) mortality – provincial mortality rate for ALL cases is 20%

EVT Mortality Rate (Anterior Cases)



Kingston Health  
Sciences Centre

Centre des sciences de  
la santé de Kingston

# STROKE ACR REVIEW: DATA QUALITY CONSIDERATIONS

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## 898 calls for service were reviewed

Between January 1, 2021 and December 31, 2021

## The review focused on four things:

1. To determine if the patient was managed under the Acute Stroke Protocol
2. Validate the symptom onset/ last seen normal time, if it was documented
3. Determine the closest hospital, and if it was bypassed
4. Determine the reasons why patients met, or didn't meet the Acute Stroke Protocol

# STROKE ACR REVIEW - THEMES

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1. “Time of Occurrence” documentation not standard
2. Stroke assessment documentation not standard  
Stroke assessment findings (facial assessment, extremity assessment, speech assessment, last seen normal) were not consistently documented in the physical exam sections.
3. Specialty Transport Code not used (55% of the time)

# STROKE ACR REVIEW - RECOMMENDATIONS

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1. Define expectations of symptom assessment, last seen normal time, and disposition decision documentation (“bundle of care”).
2. Systematic review of stroke assessments and quality of care.
3. Develop QA KPIs for stroke assessment, stroke bypass, and stroke care.
4. Create ongoing CQI program around stroke management.

# Large Vessel Occlusion Screening Tools

## **Paramedic Prompt Card**

Revised BLS 3.3 launch Jan 2021

**“LAMS”** Large Vessel Occlusion  
Screening Tool

now in Use by Paramedic Services

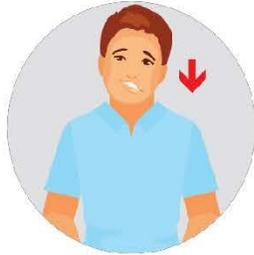
## **ED Walk-in Protocols**

revised in 2019-20 in use in EDs up to  
24-hours post stroke onset

**“ACT-FAST”** screening tools

# LAMS SCORECARD

Would this patient benefit from StrokeEVT?



## STEP 1 FACIAL DROOP

Ask the person to smile. Is there any weakness or facial droop?

- 0 Absent
- 1 Facial droop present



## STEP 2 ARM DRIFT

Bring the person's arm(s) up to a 90° angle and ask them to hold that position for 10 seconds. Is there any drift or drop of an arm?

- 0 Absent
- 1 Drifts Down
- 2 Falls Rapidly



## STEP 3 GRIP STRENGTH

Ask the person to grip your hands. Does one hand have less power than the other?

- 0 Normal
- 1 Weak Grip
- 2 No Grip



LVO  
positive If  
score is  
**≥ 4**

## STEP 4 ADD SCORE

Total possible score is 5

*If LAMS score is positive (4 or greater), patient may be eligible for EVT*

- **Los Angeles Motor Scale (LAMS)** is a brief 3-item stroke severity assessment measure designed for pre-hospital use.
- It identifies possible **large vessel occlusion (LVO) stroke** & potential eligibility for endovascular thrombectomy (EVT).
- *A score of 4 or greater is considered positive.*
- Patients scoring 4 or 5 may benefit from EVT to reduce or eliminate disability.

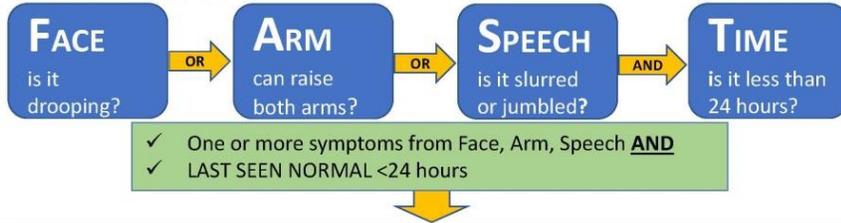
### Key Messages for Southeastern Ontario

1. There is **NO change across Southeastern Ontario in terms of stroke bypass/re-direct**. The process is the **usual Acute Stroke Protocol process** for paramedics. Patients who fit prompt card criteria will go to closest Stroke Centre if within 6 hr time window. Outside 6-hr time window, they go to local hospital ED who will assess & decide on transfer to KGH for EVT. **EDs are using ACT FAST as their LVO screen/triage tool & can transfer directly to KGH on stroke protocol if ACT FAST positive in 6 to 24 hour time window.**
2. Paramedics **provide CACC with actual LAMS score.**
3. Paramedics **let local hospital ED know they have a patient that is LVO positive when patching in about Acute Stroke Protocol.** This gives ED a **“heads up”** to help EDs make faster decisions about Acute Stroke Protocol including transfers.

## TRIAGE TOOLS for Acute Stroke < 24 hours

STROKE NETWORK  
of Southeastern Ontario

### FAST Stroke Screen:



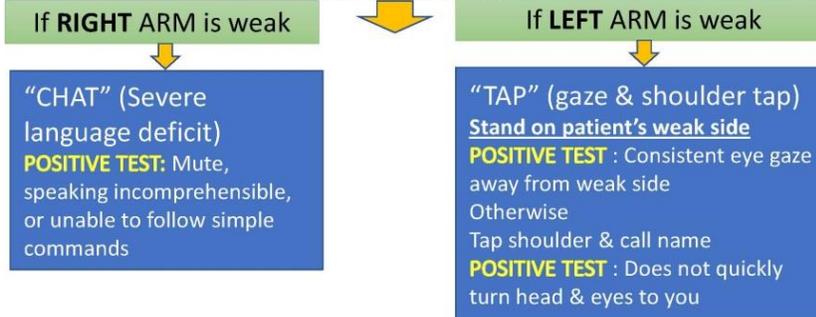
IF  $\leq 6$  hours, refer to Pink Poster to activate Acute Stroke Protocol  
IF 6 -24 hours, Complete **ACT-FAST**

### ACT-FAST Stroke Screen:

**"ARM"** (one-sided arm weakness)  
Position both arms at 45° from horizontal with elbows straight  
**POSITIVE TEST** : One arm falls completely within 10 seconds

For patients that are uncooperative or cannot follow commands:  
**POSITIVE TEST**:  
Witness minimal or no movements in one arm & movements in other arm

#### Proceed if Positive



#### Proceed if Positive

Physician will assess EVT Eligibility (Positive if All Criteria Met)

1. Deficits are NOT pre-existing (mild deficits now worse are acceptable as true deficits)
2. Living at home independently– must be independent with hygiene, personal care, walking
3. Does NOT have stroke mimics: seizure preceding symptoms, Hypoglycemia = glucose less than 2.8 mmol/L, Active malignancy with brain lesions

#### Proceed if Positive

Refer to Pink Poster to Activate Acute Stroke Protocol

2019-04-29

### Additional Tips:

If patient is uncooperative or cannot follow commands & you clearly witness minimal or no movements in one arm and normal or spontaneous movements in the other arm, THEN proceed to next ACT-FAST Step

If both arms are similarly weak, or testing is clearly affected by shoulder problems or pain, notify ED physician

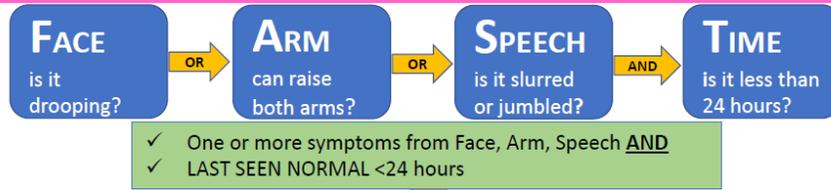
- Try to use clues to guess time last seen well – did someone talk to or call patient?
- For suspected Wake-Up symptoms, did patient get up overnight? Were they normal when first getting up?
- Negative eligibility if time of onset is > 24 hours

- If there is uncertainty as to time of symptom onset or whether a patient meets the ACT-FAST or Acute Stroke Protocol criteria, the ED physician can contact the neurologist on call for stroke for consultation

**Reminder: Sample USED by ED STAFF  
in Brockville, Perth & Smiths Falls,  
Napanee and HDH**

Adapted from "Ambulance Clinical Triage for Acute Stroke Treatment" Zhao et al. Stroke 2018; 49: 945-951

**QHC-Trenton Memorial , Prince Edward County Memorial & North Hastings Hospitals- TRIAGE TOOLS for Acute Stroke < 24 hours**



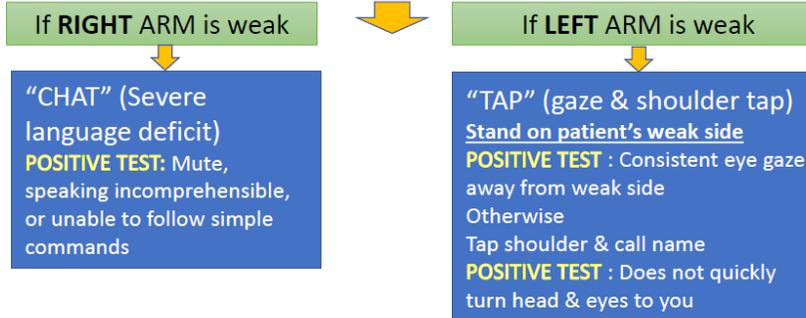
IF ≤ 6 hours, activate usual QHC Code Stroke to Belleville General  
IF 6 -24 hours, Complete **ACT-FAST**

**ACT-FAST Stroke Screen:**

**“ARM”** (one-sided arm weakness)  
Position both arms at 45° from horizontal with elbows straight  
**POSITIVE TEST** : One arm falls completely within 10 seconds

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**Proceed if Positive**

Physician will assess EVT Eligibility (Positive if All Criteria Met)

1. Deficits are NOT pre-existing (mild deficits now worse are acceptable as true deficits)
2. Living at home independently–independent with hygiene, personal care, walking
3. Does NOT have stroke mimics: seizure preceding symptoms, Hypoglycemia = glucose less than 2.8 mmol/L, Active malignancy with brain lesions

**Proceed if Positive**

Activate Acute Stroke Protocol to KGH ED. Call Ambulance Dispatch & KGH ED Charge RN (613) 549-6666 extension 7003. Inform them patient meets Acute Stroke Protocol & is ACT-FAST Positive between 6-24 hours

2019-10-17

**Sample Poster USED by ED STAFF in Bancroft, Picton and Trenton**

**Additional Tips for 6-24 hour Time Window:**

- Try to use clues to guess time last seen well – did someone talk to or call patient?
- For suspected Wake-Up symptoms, did patient get up overnight? Were they normal when first getting up?
- Negative eligibility if time of onset is > 24 hours

If patient is uncooperative or cannot follow commands & you clearly witness minimal or no movements in one arm and normal or spontaneous movements in the other arm, THEN proceed to next ACT-FAST Step

If both arms are similarly weak, or testing is clearly affected by shoulder problems or pain, the ED physician can contact the neurologist on call for stroke for consultation

If there is uncertainty as to time of symptom onset or whether a patient meets the ACT-FAST or Acute Stroke Protocol criteria, the ED physician can contact the neurologist on call for stroke for consultation

**Additional Steps for 6-24 hour Time Window:**

If ACT-FAST Positive: Complete the following if time permits in ED (never delay transfer to complete):

- A. Preferred:
- 1 IV (no glucose solutions unless required)
  - 1 saline lock started with an 18 gauge needle in the right antecubital fossa unless contraindicated
- B. Optional (If time still permits):
- CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, pregnancy test (βHCG) if indicated
  - ECG

Fax blood work and all relevant patient information to KGH Emergency Department: 613-548-2420

# CorHealth Ontario LAMS Survey Results

- 26 Surveys were received representing all 55 Paramedic Service Providers listed on the Ontario Paramedic Association's website
- Most providers are completing the LAMS tool but communication and documentation appears to be inconsistent within and across providers.
- Most regions are NOT using LAMS to change EMS transport destinations
- Challenges:
  - Inconsistent use and documentation
  - Education and training
  - LAMS in use by paramedics, ACT FAST in use by EDs
  - Unclear messaging and expectations on how to report (score + or -)
  - ED uses ACT Fast up to 24 hours, EMS only using LAMs up to 6 hours
  - Discrepancy in how transfers are actioned in 6 to 24 hours (CTAS 2 / Code 4 etc)

# Recommendations from CorHealth Hyperacute Task Group – for continued consideration with EHRAB\*

\*Emergency Health Regulatory and Accountability Branch

- Use terminology of “LVO +/-” vs actual score when communicating with CACC, ACS and/or hospital
- Use LAMS as a secondary screen for all probable stroke presenting within **24 hours**, and if LAMS positive, classify as CTAS 2, and alert hospital “LVO positive” regardless of destination
- Rationale: All probable strokes are treated with urgency up to 6 hours regardless of LVO status but urgency is also needed for LVO positive patients **after 6 hours** given they may be eligible for EVT
- Any feedback on these ideas?

# Other Updates - NEW!!

- **AcT Research Trial – Dr Jin**

Randomized Controlled Trial of **TNK vs tPA** for all eligible for thrombolysis

RESULTS: **TNK is non-inferior to tPA**; TNK a reasonable alternative to tPA in acute ischemic stroke

**Next steps:** awaiting publication and revision of best practice guidelines; not yet approved by Health Canada

- **Endovascular coiling of cerebral aneurysms: KHSC designation**

- Ruptured coiling for those with subarachnoid haemorrhage has been underway; program growth over last 2 years

- **Elective Coiling also now well established**

- Patients no longer need to be transferred to Toronto or Ottawa for coiling

- **EVT: Others may refer to KHSC for EVT**

- **Campbellford** (> 6 hours)

- **James Bay Coast** (back up for Sudbury) – small volumes

# Final Reminders!!

- Importance of pre-notification
  - Call ahead - provide ED with patient name/DOB if possible
  - Inform ED of estimated time of arrival – if delayed, let them know
  - Inform if patient is “LVO positive or negative”
- IV starts en route
- Documentation of ASP: onset time – LSN; stroke assessment; special transport code; reasons why met / did not meet ASP
- Encourage public awareness of FAST, especially during COVID-19
- Contacts:
  - Regional Stroke Director, Cally Martin  
[cally.martin@kingstonhsc.ca](mailto:cally.martin@kingstonhsc.ca)
  - Regional Stroke Best Practice Coordinator, Colleen Murphy  
[colleen.murphy@kingstonhsc.ca](mailto:colleen.murphy@kingstonhsc.ca)
  - Quinte Health Care Stroke Resource Nurse, Melissa Roblin  
[MRoblin@QHC.on.ca](mailto:MRoblin@QHC.on.ca)

**Stroke is a medical emergency. Do not hesitate.  
Call 9-1-1 even during the COVID-19 pandemic.**

Learn the signs of stroke

- F**ace is it drooping?
- A**rms can you raise both?
- S**peech is it slurred or jumbled?
- T**ime to call 9-1-1 right away.

[heartandstroke.ca/FAST](http://heartandstroke.ca/FAST)



# THANK YOU!



Learn the  
signs of stroke

**F**ace is it drooping?

**A**rms can you raise both?

**S**peech is it slurred or jumbled?

**T**ime to call 9-1-1 right away.

Act **FAST** because the quicker  
you act, the more of the person you save.

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[www.strokenetworkseo.ca](http://www.strokenetworkseo.ca)