Regional Paramedic Program for Eastern Ontario

Emergency Stroke Care

How are we doing?

Southeast Regional & District Acute Stroke Protocol Committee Annual Meeting June 2023

Evaluation data shared with special thanks to

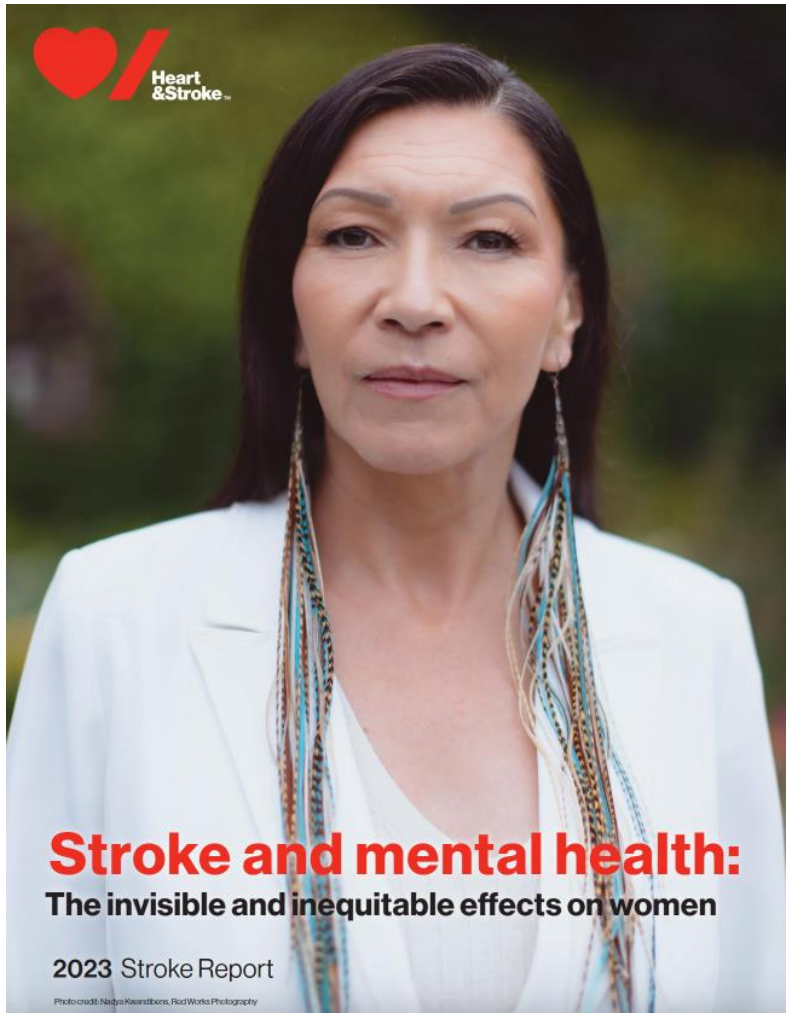
- All 5 Paramedic Services
- Regional Paramedic Program of Eastern Ontario - Stroke Report
- QHC and KHSC Stroke Teams

strokenetwork SOUTHEASTERN ONTARIO

June is Stroke Awareness Month!!

Heart & Stroke 2023 Reports

Stroke and mental health: The invisible and inequitable effects on women.



Heart & Stroke Women's Report 2023 System failure

"What we don't know is hurting women"

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

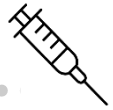
strokenetwork SOUTHEASTERN ONTARIO

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 time (Target: <30 minutes) (ON 44.0)

6.9% EVT (Endovascular therapy) (ON5.8%)

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

REHABILITATION OPTIMIZES RECOVERY

9 days ** ↑ (ON 8.0)
Median time from acute admission to inpatient rehabilitation

26.2%** ↑ (ON 31.4%)
of patients accessed inpatient rehabilitation

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

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%)

Ontario Health
CorHealth Ontario

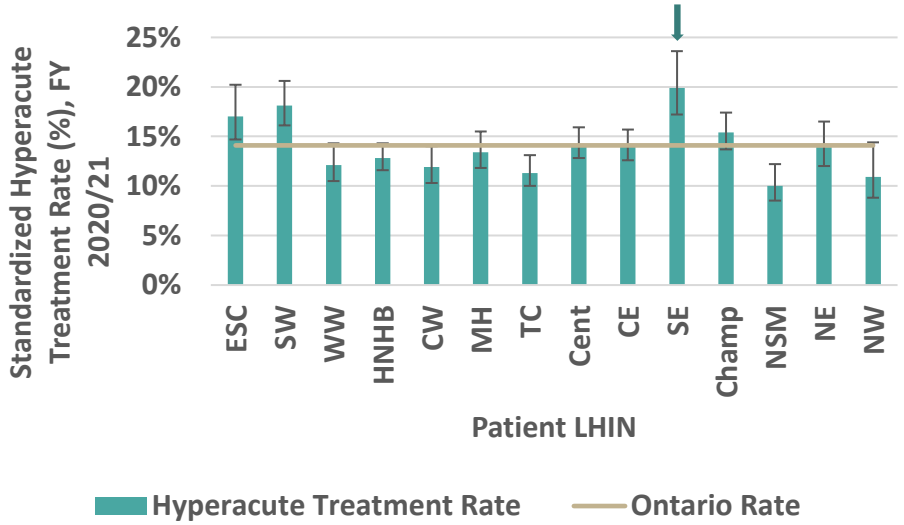
*There is currently no data available for outpatient rehabilitation and secondary prevention clinic.
** 2020/21 Q2 (YTD)

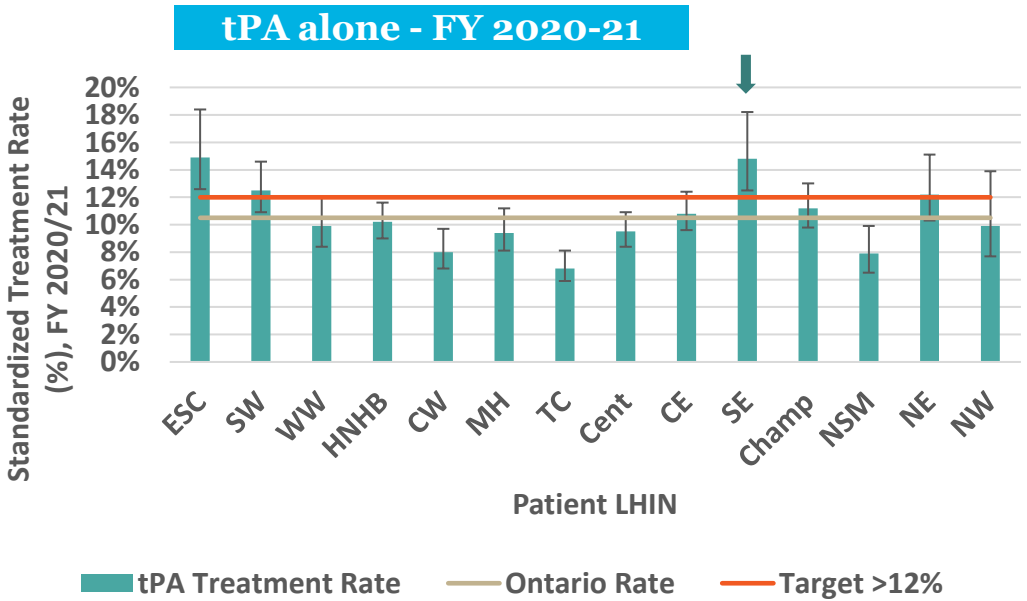
Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke

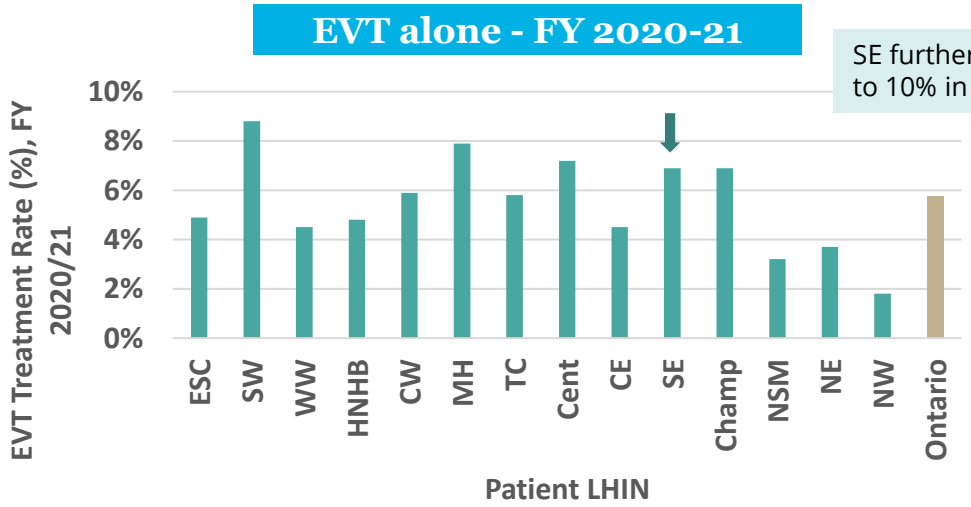
Indicator 2.1.1: Standardized Hyperacute Treatment Rate (tPA and/or EVT), FY 2020/21

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.





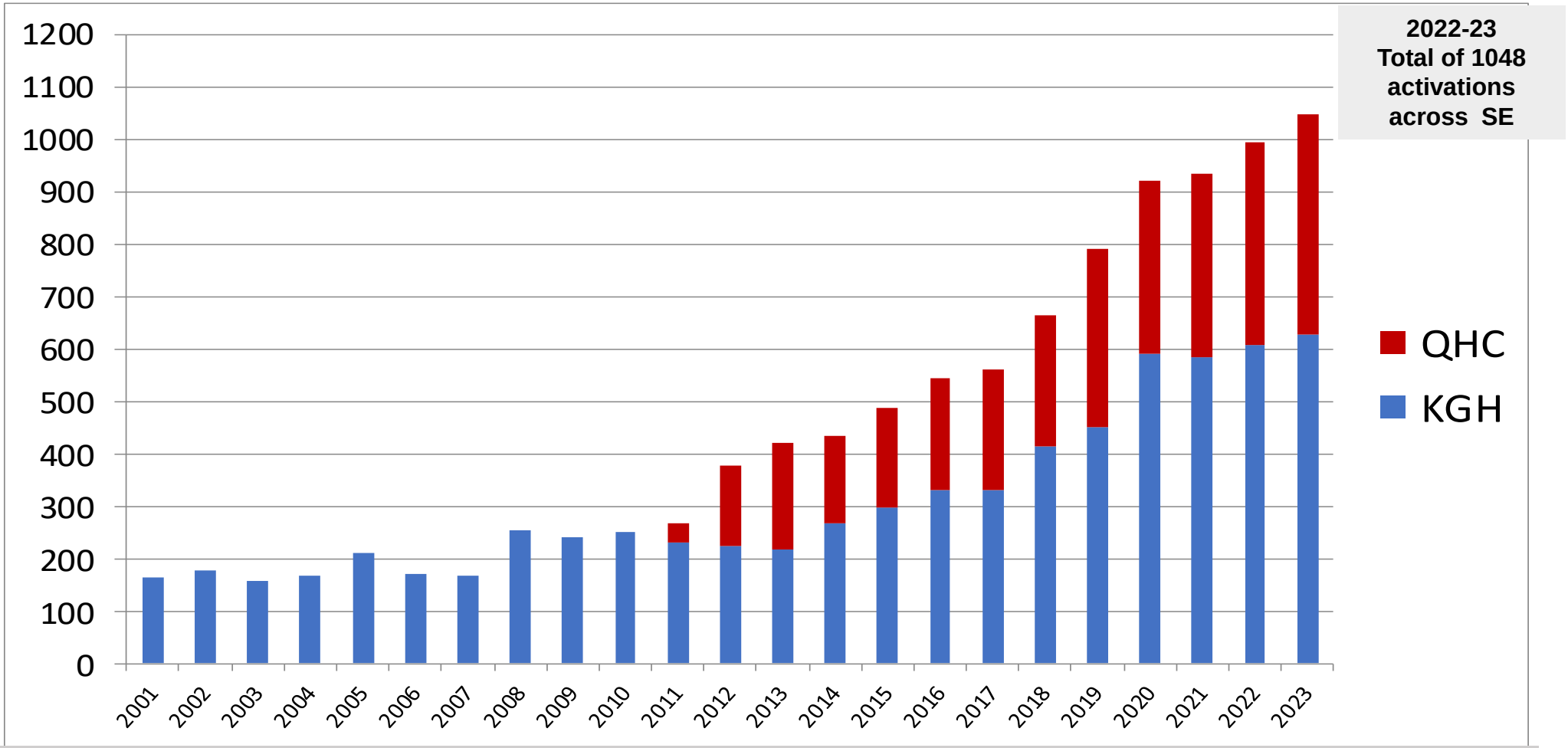


SE further Increased to 10% in 2023-24

Next Ontario Stroke Report

- The next Ontario Stroke Report will not be released until later in 2023 – likely later fall.
- However, we continue to have local hyperacute data to share from our stroke centres and from the RPPEO Stroke Report.

SEO ASP Activations KHSC/QHC by Fiscal Year



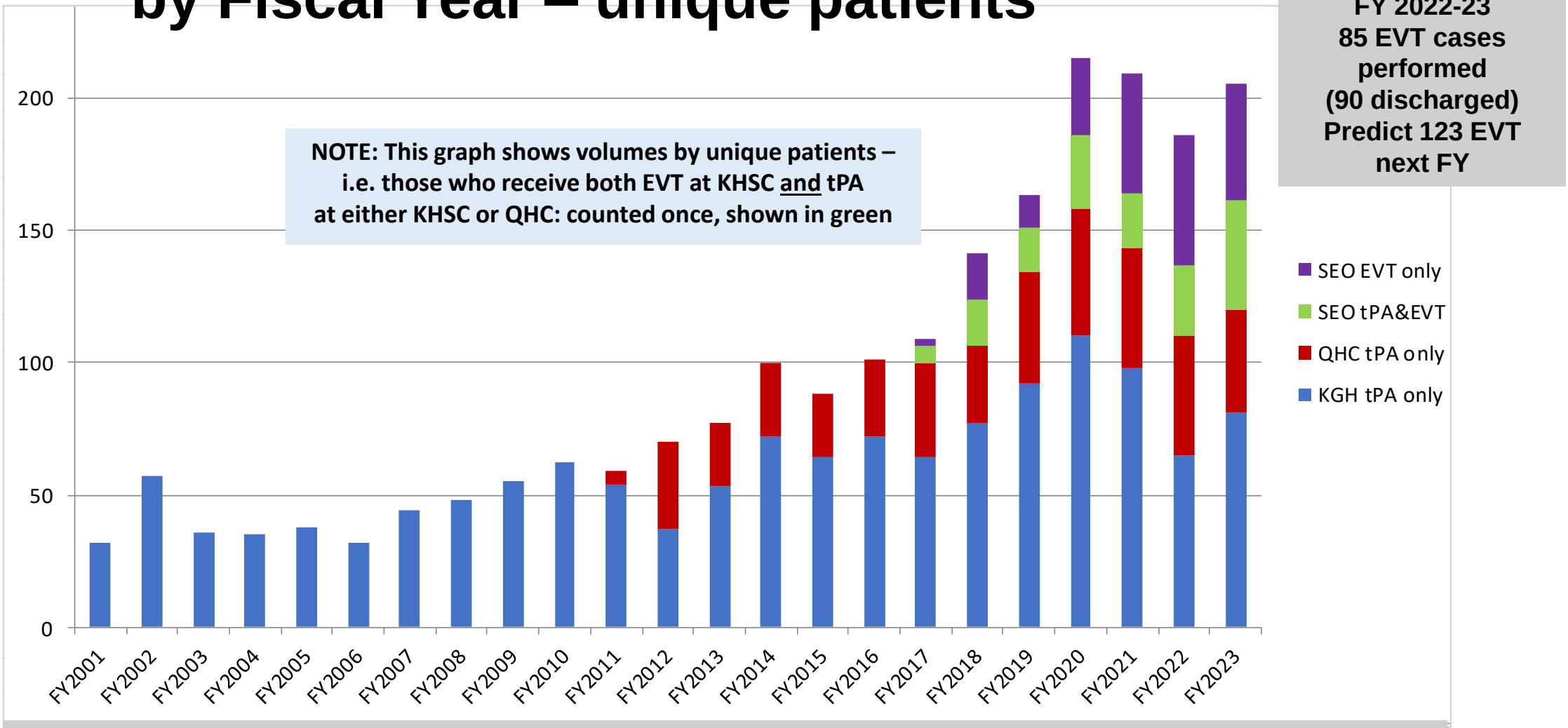
2022-23 – 1048 stroke protocol activations at QHC and KHSC- up from 994 last year

Includes 133 In-hospital stroke protocol activations – up from last year at 118

Note re In-hospital activations:

- **83 at KGH – 8 treated (2 thrombolysis + 6 EVT);**
- **50 at QHC – 1 tPA**

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



FY 2022-23
85 EVT cases performed (90 discharged)
Predict 123 EVT next FY

Growth in EVT rates; *RAPID* imaging supports patient selection
Median Door-to Needle (DTN) times:
2022-23 KGH 26 mins; QHC 35 mins
Key DTN factors: pre-notification; stay on paramedic stretcher to CT; tPA/TNK in CT suite

Regional Paramedic Program for Eastern Ontario

Regional Paramedic Program for Eastern Ontario
Stroke Report - Fiscal Year 2022-23

with thanks to

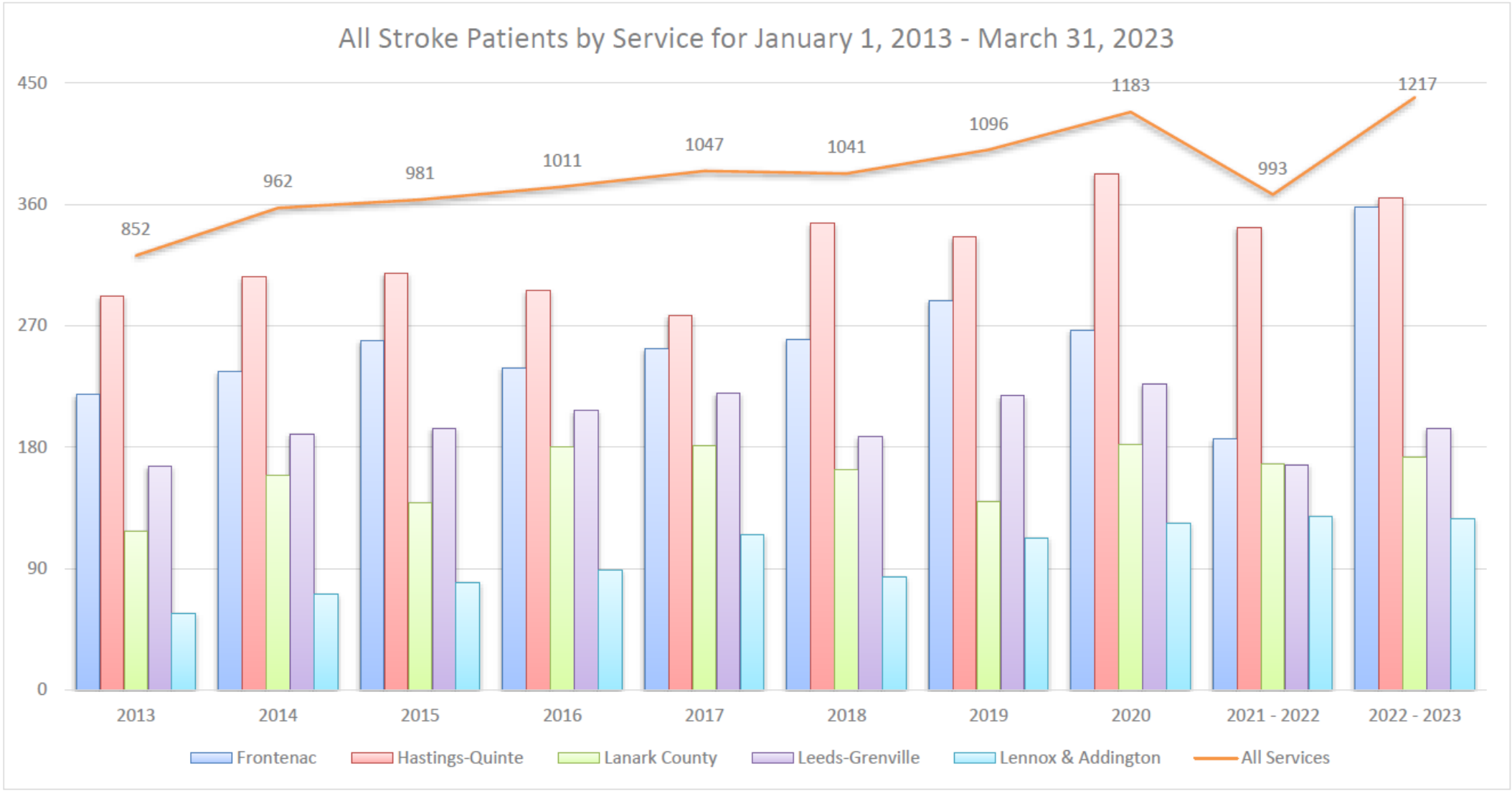
Base Hospital Program, The Ottawa Hospital
Megan Wall, EMS Coordinator
Yiping Ma, Analyst
James Bowen, EMS Coordinator
Benjamin de Mendonca, Manager, Quality & Patient Safety

and

All Paramedic Services

All Stroke Patients by Paramedic Service x 10 yrs

Data Source: RPPEO Stroke Report FY 2022-23



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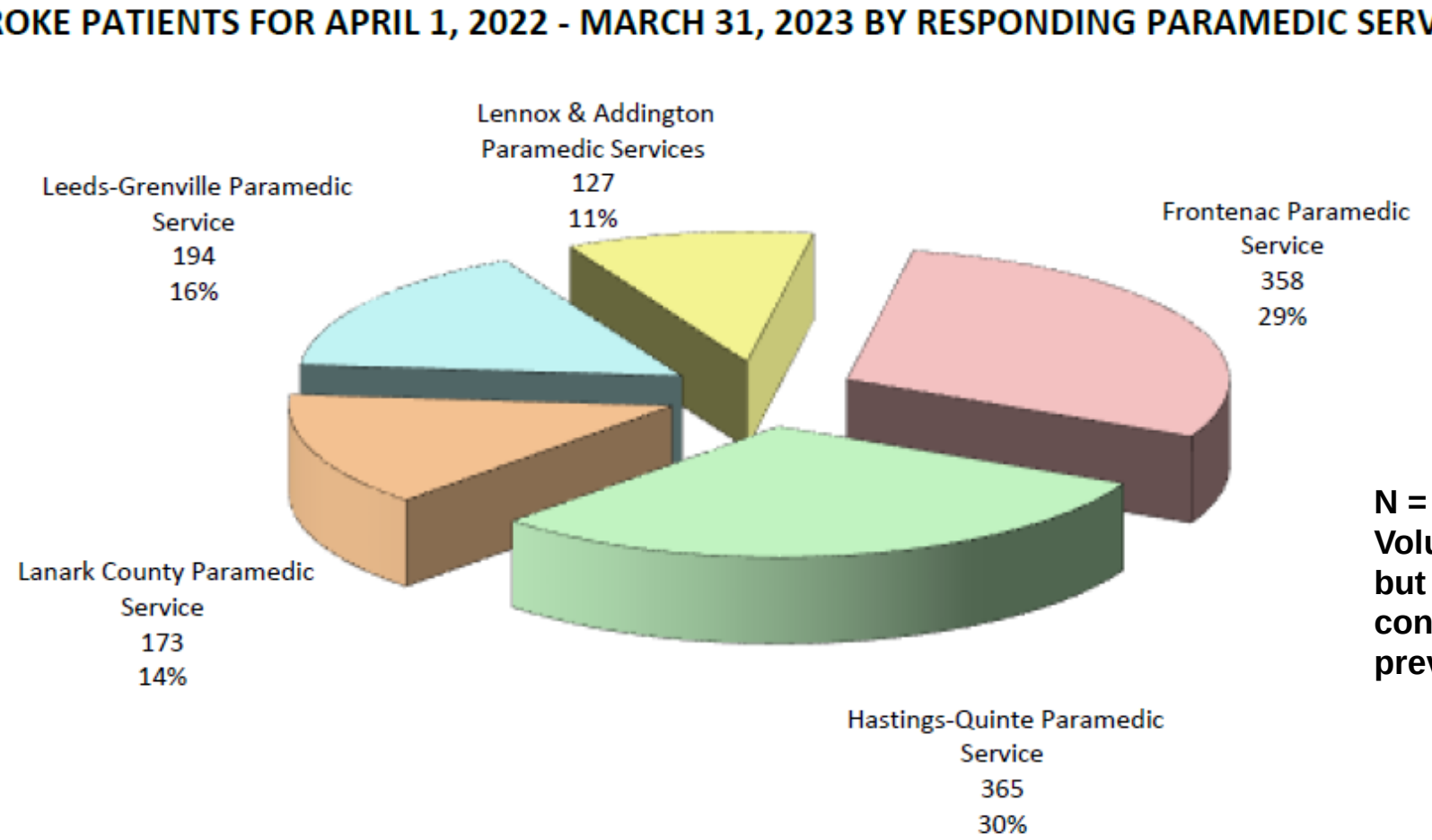
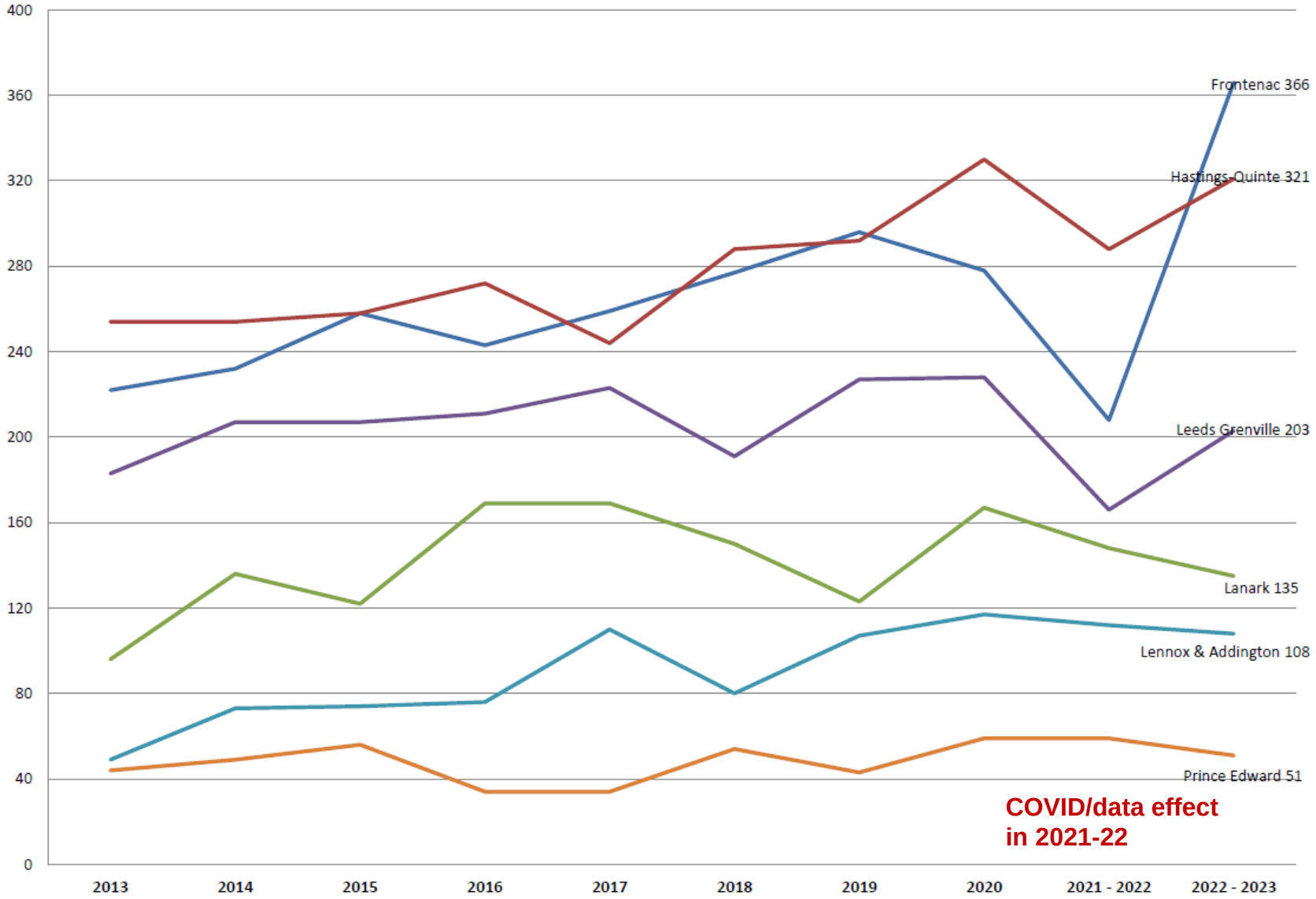


N = 1217
Volumes increasing but proportions fairly consistent over previous years

ALL Stroke Calls by County over 10 years

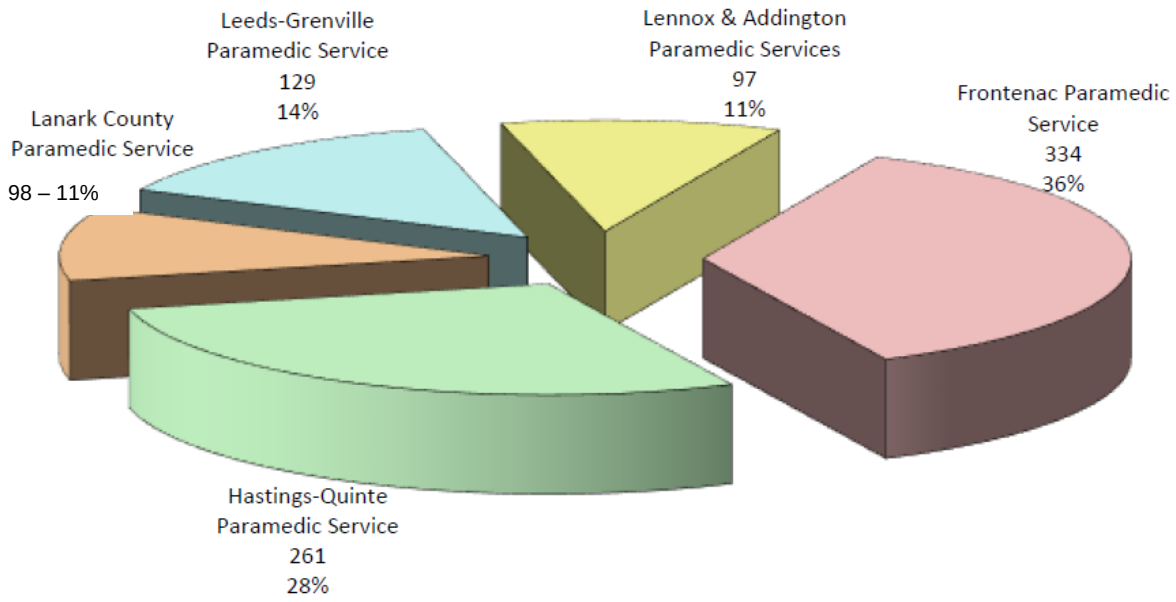
Data Source: RPPEO FY2022-23 Stroke Report



Acute stroke calls taken to stroke centres FY 2022-23
N=919 of total 1217

75.5% of all stroke patients were taken directly to an acute stroke centre
539 = stroke centre was closest hospital; 292 = bypasses; 88 = transfers

ACUTE STROKE PATIENTS TRANSPORTED TO STROKE CENTRES BETWEEN APRIL 1, 2022 AND MARCH 31, 2023 BY RESPONDING PARAMEDIC SERVICE **N = 919**



Reasons **298** patients were **not** redirected to stroke centre:

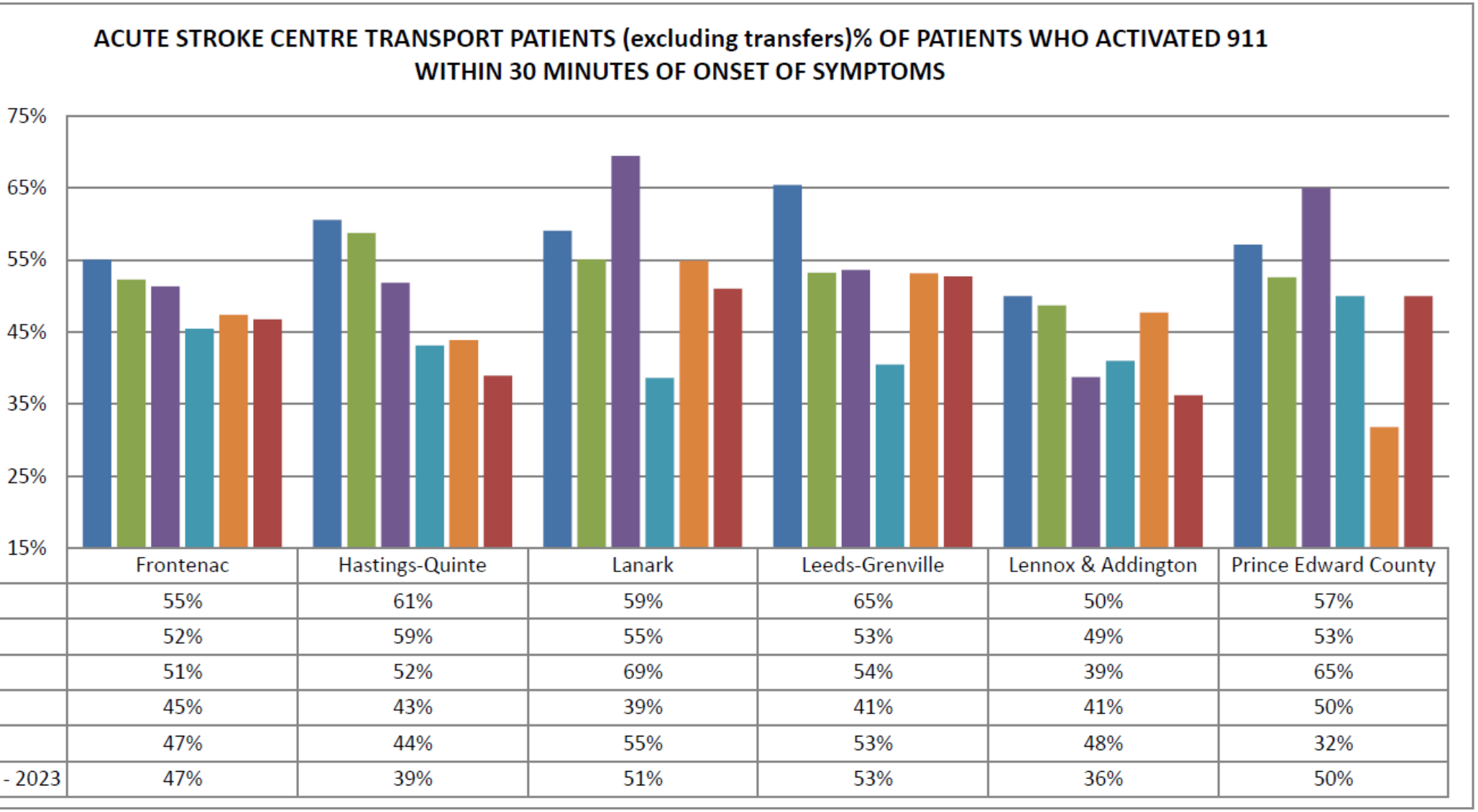
- **Unable to determine LSN = 51 (17%)**
- **Unable to deliver to stroke centre < 6 hrs = 104 (35%)**
  NOTE: OVER 50% related to TIME

- Symptoms resolved prior to departing = 93 (31%)
- Seizure at onset of symptoms =14 (5%)
- Unstable or LOC = 13 (4%)
- Terminally ill/palliative = 3
- Symptoms mild = 1
- Reason unclear = 19 (6%)

Data Source: RPPEO Stroke Report FY 2022-23

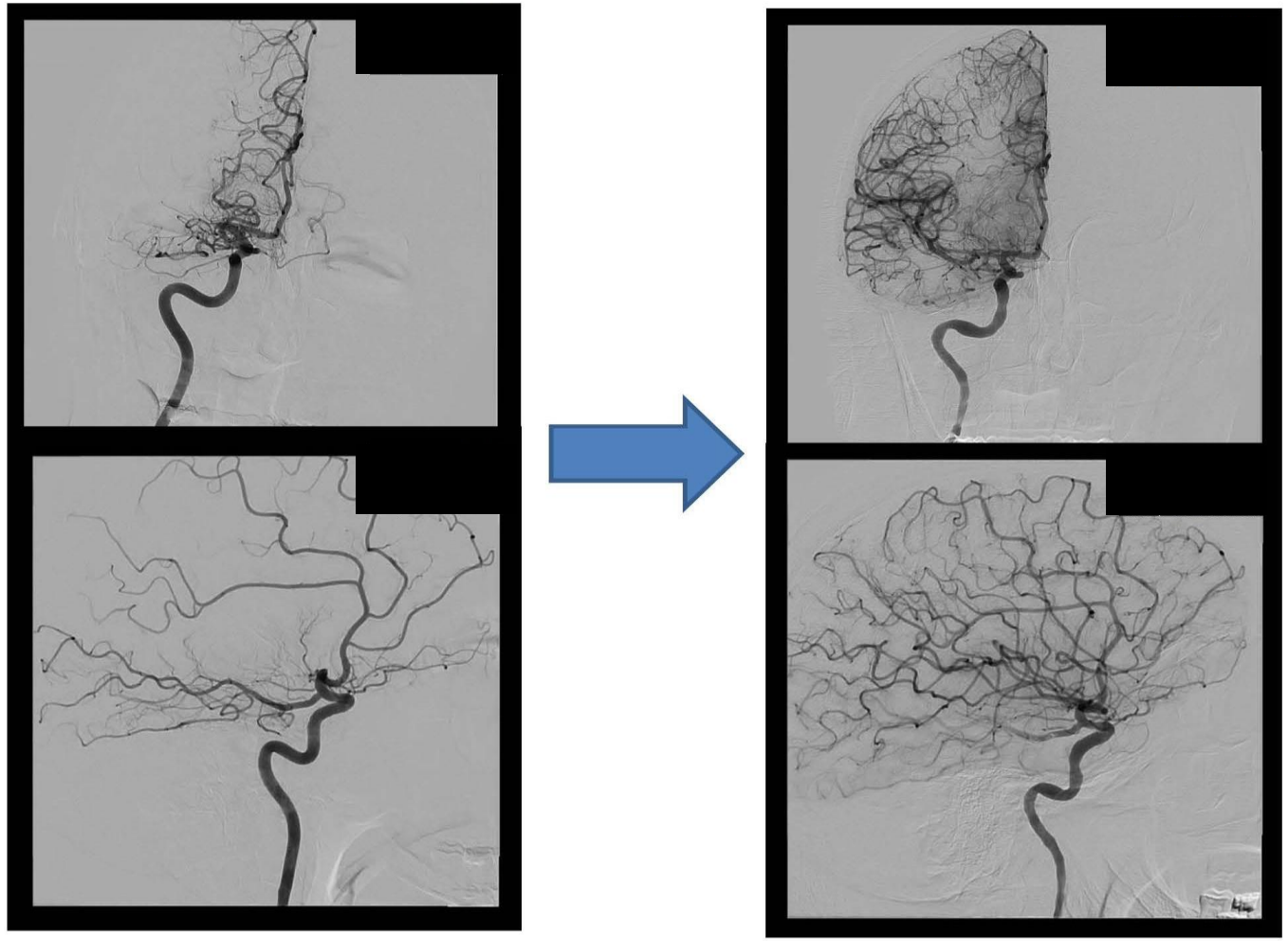
Under 50% call 911 within 30 mins of symptom onset

Data Source: RPPEO Stroke Report FY 2022-23



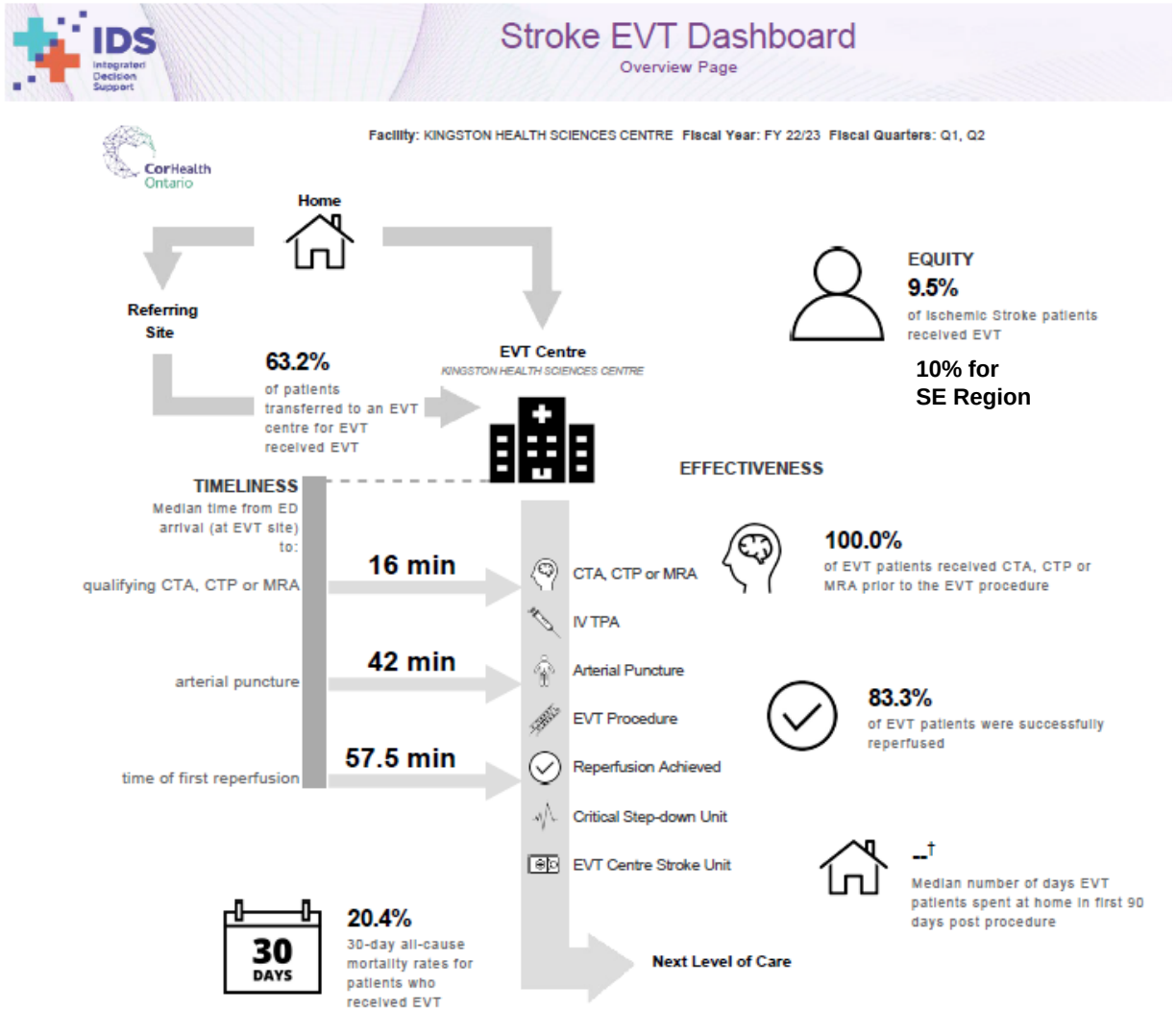
	Frontenac	Hastings-Quinte	Lanark	Leeds-Grenville	Lennox & Addington	Prince Edward County
2017	55%	61%	59%	65%	50%	57%
2018	52%	59%	55%	53%	49%	53%
2019	51%	52%	69%	54%	39%	65%
2020	45%	43%	39%	41%	41%	50%
2021	47%	44%	55%	53%	48%	32%
2022 - 2023	47%	39%	51%	53%	36%	50%

KHSC EVT Current Outcomes

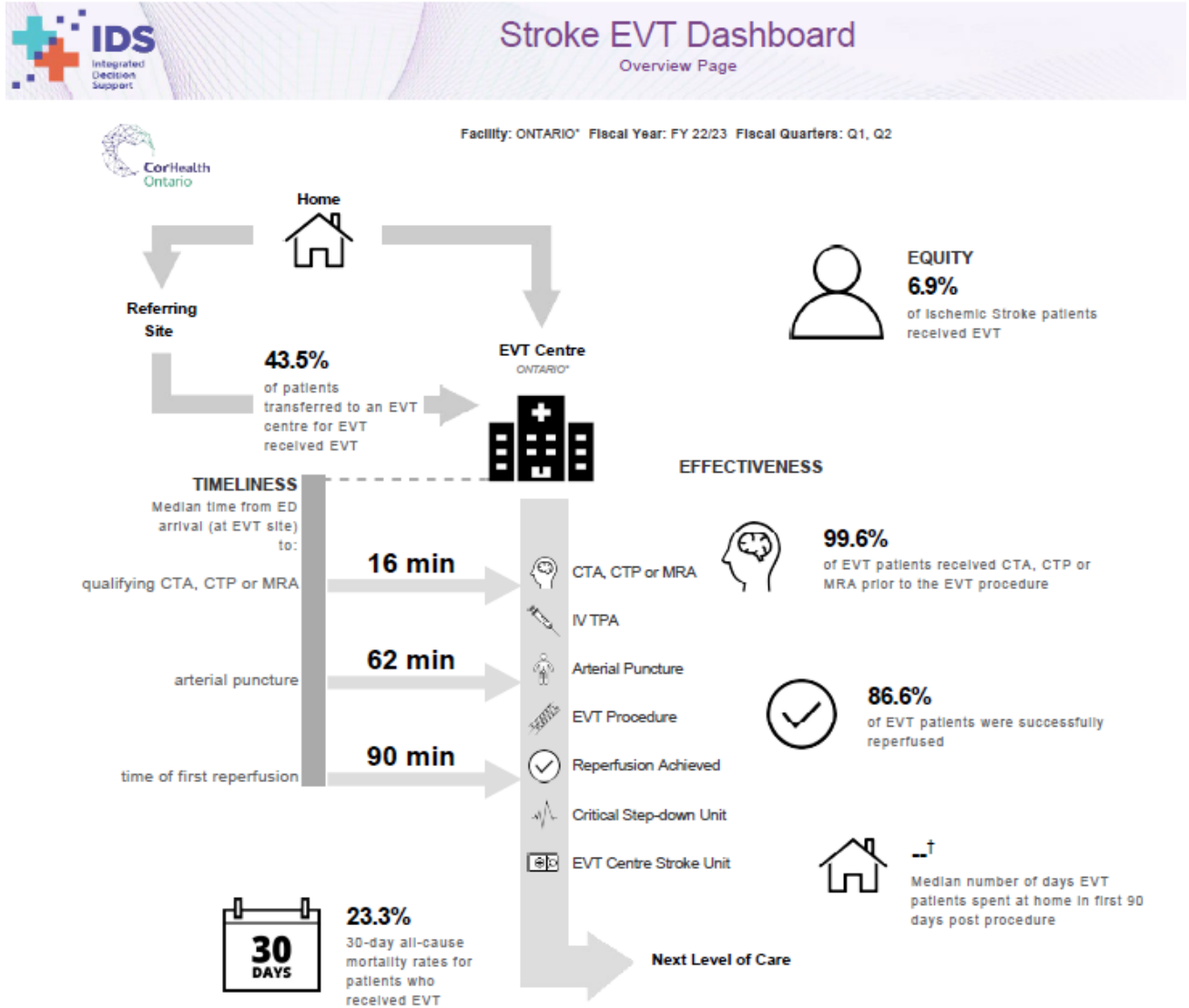


CorHealth Ontario EVT Report
FY 2022-23 – Q1, Q2 (April to Sept)

Kingston



Ontario



KHSC EVT Current Outcomes

Hermes Meta-Analysis: 46% with 90 day Modified Rankin Scale (MRS) score of ≤ 2 (minimal to no disability)

335 anterior and 22 posterior cases to March 31, 2023

Most recent analysis FY 2022-23 :

82 anterior, 8 posterior circulation cases discharged

- ongoing growth from last fiscal
- Geographic distribution: HPE – 24; KFLA – 36 (6 from L&A); LLG – 26; 4 out of region
- 48 female/42 male

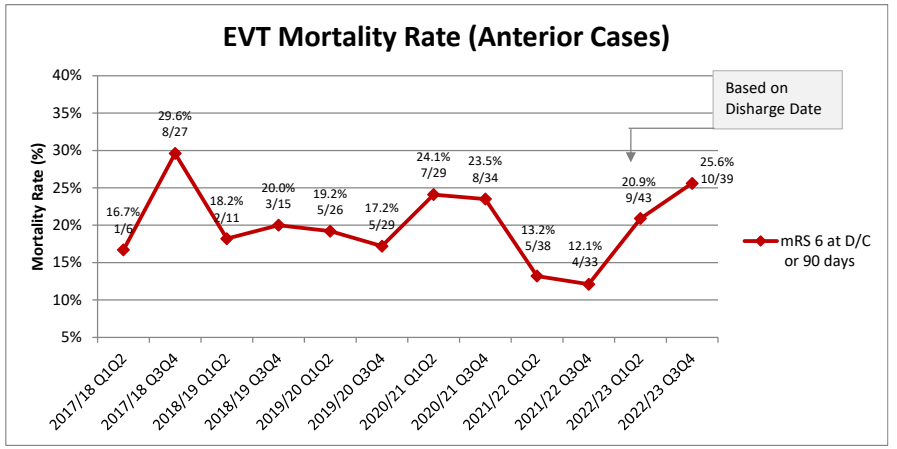
For the 82 anterior cases – using Best MRS score – some still improving

- 27/82 (32.9%) with minimal to no disability MRS </= 2
- 24/82 (29.3%) with moderate disability
- 12/82 (14.6%) with severe disability
- 19/82 (23.2%) mortality

Times: 12 min D to CT; 41 min D to puncture, 56 min D to Reperfusion (target 90 mins)
(26 min DTN for all thrombolysis patients)

40 cases treated between 6 and 24 hours in FY 2022-23

- 36 Anterior cases & 4 Post cases: HPE - 12; KFLA - 16 (3 L&A); LLG – 11; 1 other region
- Disability Outcomes:
  - 11/36 (30.6%) minimal to no disability
  - 13/36 (36.1%) moderate disability
  - 6/36 (16.7%) severe disability
  - 6/36 (16.7%) mortality – provincial mortality rate for ALL cases is 23%



Kingston Health Sciences Centre
Centre des sciences de la santé de Kingston

Ontario Telestroke Report Data Quality Work Ongoing

Next release 2024-5

Emerging Research Evidence

- TNK non inferior to tPA
- Thrombolysis after 4.5 hours from symptom onset, up to 9 hours (stroke expertise needed)
- EVT for large stroke - large core infarcts
- IA tPA after EVT
- See Hyperacute presentation from Regional Stroke Symposium

  Dr. Al Jin, MD, Stroke neurologist, Medical Director SNSEO
  - Slides – Recent advances in hyperacute and acute stroke care
  - Watch the video recording here
- Discussion

STROKE ACR REVIEW – DATA QUALITY THEMES

REGIONAL PARAMEDIC PROGRAM FOR EASTERN ONTARIO

NOTE: Specialty Transport Code not used - unable to track if ASP or not without manual audit

Other reminders from last year's audit:

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.

Basic Life Support Patient Care Standards

Version 3.4

Comes into force
March 10, 2023

Emergency Health
Regulatory and
Accountability Branch
Ministry of Health

Ontario

Large Vessel Occlusion Screening Tools

Paramedic Prompt Card

Revised BLS 3.4

“LAMS” Large Vessel Occlusion Screening Tool

in use by Paramedic Services **to 24 hours**

ED Walk-in Protocols

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

“ACT-FAST” screening tools

Paramedic Basic Life Support Standards
LAMS Screen to 24 hours

Change in BLS Standards 3.4 for Stroke Care March 2023 page 77

6. perform a secondary screen for LVO stroke using the Los Angeles Motor Scale (LAMS) for all probable stroke patients presenting within 24 hours of stroke symptom onset.
   a. if LAMS is greater than or equal to 4 (≥4), classify the patient as CTAS 2,
   b. inform the receiving hospital whether "LVO Clinical Screen is positive or negative "
   c. Document LAMS screen for patients presenting with CVA/Stroke symptoms 0-24 hours from symptom onset.

***** NO CHANGE to Bypass Protocol in SE region *****

Paramedic Prompt Card for Acute Stroke Bypass Protocol

This prompt card provides a quick reference of the *Acute Stroke Protocol* contained in the *Basic Life Support Patient Care Standards* (BLS PCS).

Indications under the Acute Stroke Protocol

Redirect or transport to the closest or most appropriate Designated Stroke Centre (DSC)* will be considered for patients who meet **BOTH** of the following:

1. Present with a new onset of at least one of the following symptoms suggestive of the onset of an acute stroke:
    a. Unilateral arm/leg weakness or drift.
    b. Slurred speech or inappropriate words or mute.
    c. Unilateral facial droop.
2. Can be transported to arrive at a Designated Stroke Centre within 6 hours of a clearly determined time of symptom onset or the time the patient was last seen in a usual state of health.

Inform the CACC/ACS to aid in the determination of the most appropriate destination.

*A Regional Stroke Centre, District Stroke Centre or Telestroke Centre regardless of EVT capability.

Large Vessel Occlusion (LVO) Assessment

Perform a secondary screen for LVO stroke using the Los Angeles Motor Scale (LAMS) for all probable stroke patients presenting within 24 hours of stroke symptom onset.

a. if LAMS is greater than or equal to 4 (≥4), classify the patient as CTAS 2
b. inform the receiving hospital whether *LVO Clinical Screen is positive or negative* **

** In select regions, LVO Clinical Screen + patients, presenting within 6 hours of stroke symptom onset, may be redirected to the closest EVT centre.

Contraindications under the Acute Stroke Protocol

ANY of the following exclude a patient from being transported under the Acute Stroke Protocol:

1. CTAS Level 1 and/or uncorrected airway, breathing or circulatory problem.
2. Symptoms of the stroke resolved prior to paramedic arrival or assessment***.
3. Blood sugar <3 mmol/L****.
4. Seizure at onset of symptoms or observed by paramedics.
5. Glasgow Coma Scale <10.
6. Terminally ill or palliative care patient.
7. Duration of out of hospital transport will exceed two hours.

***Patients whose symptoms improve significantly or resolve during transport will continue to be transported to a Designated Stroke Centre.**

****If symptoms persist after correction of blood glucose level, the patient is not contraindicated.

CACC/ACS will authorize the transport once notified of the patient's need for redirect or transport under the Acute Stroke Protocol.

Ontario

LVO screen – up to 24 hours and if positive, CTAS 2

If LVO positive, give local receiving hospital ED a heads up to triage quickly – potential transfer for EVT

LAMS SCORECARD

Would this patient benefit from StrokeEVT?

strokenetwork SOUTHEASTERN ONTARIO

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

_____

=

STEP 4
ADD SCORE

Total possible score is 5

_____

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

January 13, 2021; Adapted from Northwestern Ontario Regional Stroke Network

- **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:

FACE is it drooping? OR **ARM** can raise both arms? OR **SPEECH** is it slurred or jumbled? AND **TIME** is it less than 24 hours?

- ✓ One or more symptoms from Face, Arm, Speech **AND**
- ✓ LAST SEEN NORMAL <24 hours

IF ≤ 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 45^0 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

If **RIGHT** ARM is weak

"CHAT" (Severe language deficit)
POSITIVE TEST: Mute, speaking incomprehensible, or unable to follow simple commands

If **LEFT** ARM is weak

"TAP" (gaze & shoulder tap)
Stand on patient's weak side
POSITIVE TEST : Consistent eye gaze away from weak side
Otherwise
Tap shoulder & call name
POSITIVE TEST : Does not quickly turn head & eyes to you

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

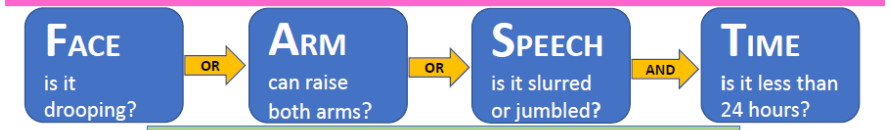
- Try to use clues to guess time last seen well – did someone talk to or call patient?
- For suspected Wake-Up symptoms, did patient get up overnight? Were they normal when first getting up?
- Negative eligibility if time of onset is > 24 hours

- 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



- ✓ One or more symptoms from Face, Arm, Speech **AND**
- ✓ LAST SEEN NORMAL <24 hours

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

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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

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

Ontario Health
CorHealth Ontario

June 2023

Guidance for Determining the need for a Medical Escort for Confirmed Life or Limb Patients[1] with Acute Ischemic Stroke being Transferred for Endovascular Thrombectomy (EVT)

Medical escort if:

- **Patient receiving IV therapy**
- **Patient has received or likely to require <u>ongoing</u> acute hypertension medication**
- **At risk of medical deterioration requiring intervention outside paramedic scope**

Offload immediately upon arrival

If received TNK and above conditions not met, a medical escort may <u>not</u> be medically required

- **Use standard protocols for allergic reactions**
- **Neither ACP or PCP have ability to treat hypertension, nor can they manage infusion pumps**
- **Only ACP can intubate**

Relevance for District Stroke Centres – QH TNK implementation

- **Updates/discussion**

Other Updates - NEW!!

- Accreditation Canada Stroke Distinction Awards 2023 – Congratulations!!
- Updates to Provincial Imaging Protocol for EVT
  - already implemented - no change for our region
- Brockville updates
- Repatriation; communication
- Community Paramedicine updates
- Other?

Final Reminders!!

- 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; LAMS score

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THANK YOU!

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