STROKE NETWORK *of* Southeastern Ontario

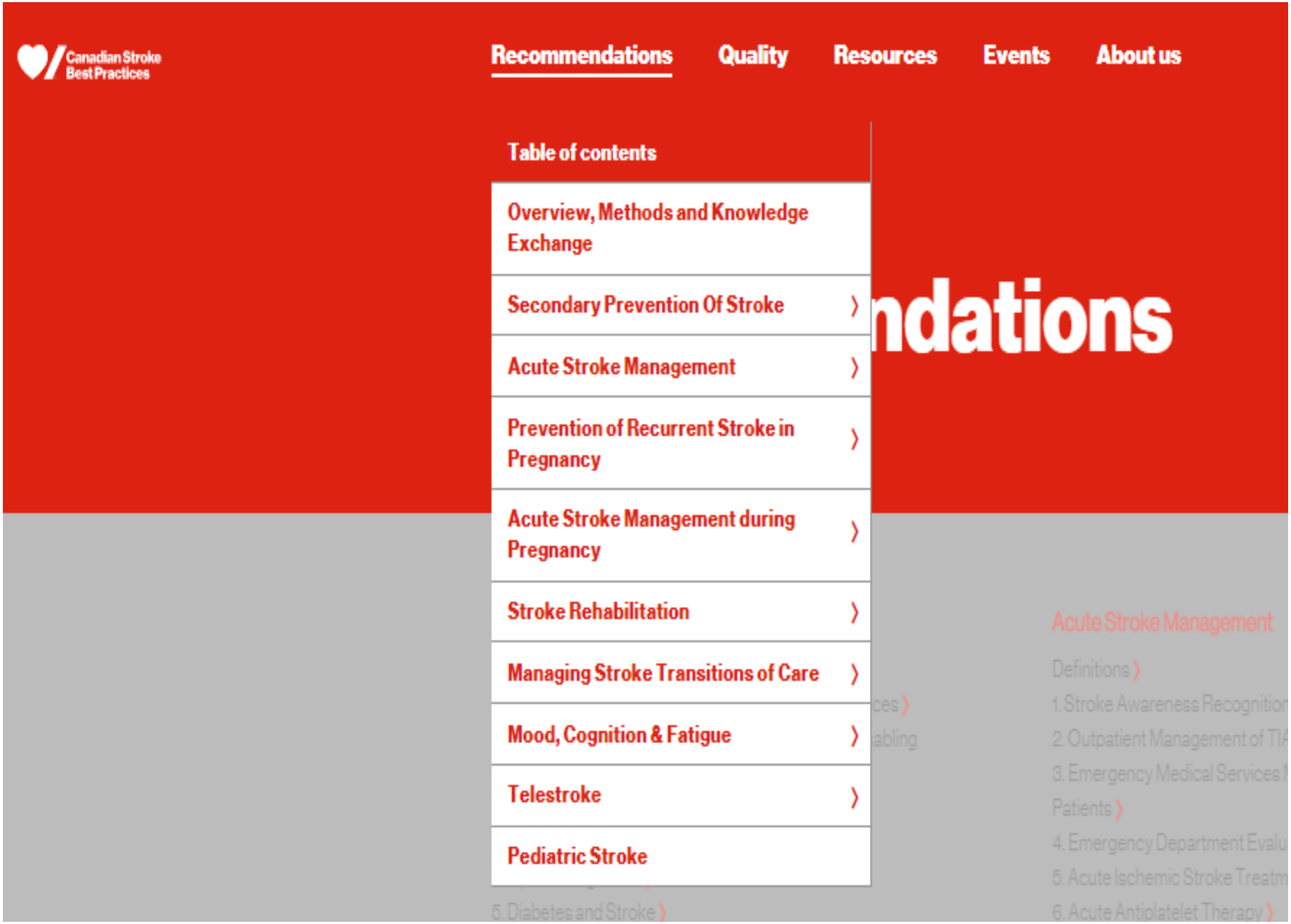
Regional Paramedic Program for Eastern Ontario

Emergency Stroke Care

How are we doing?

Southeast Regional & District
Acute Stroke Protocol Committee
May 2019

with thanks to Paramedic Services & Regional Paramedic Program of Eastern Ontario (S. Duncan) for EMS data collection; QHC and KHSC



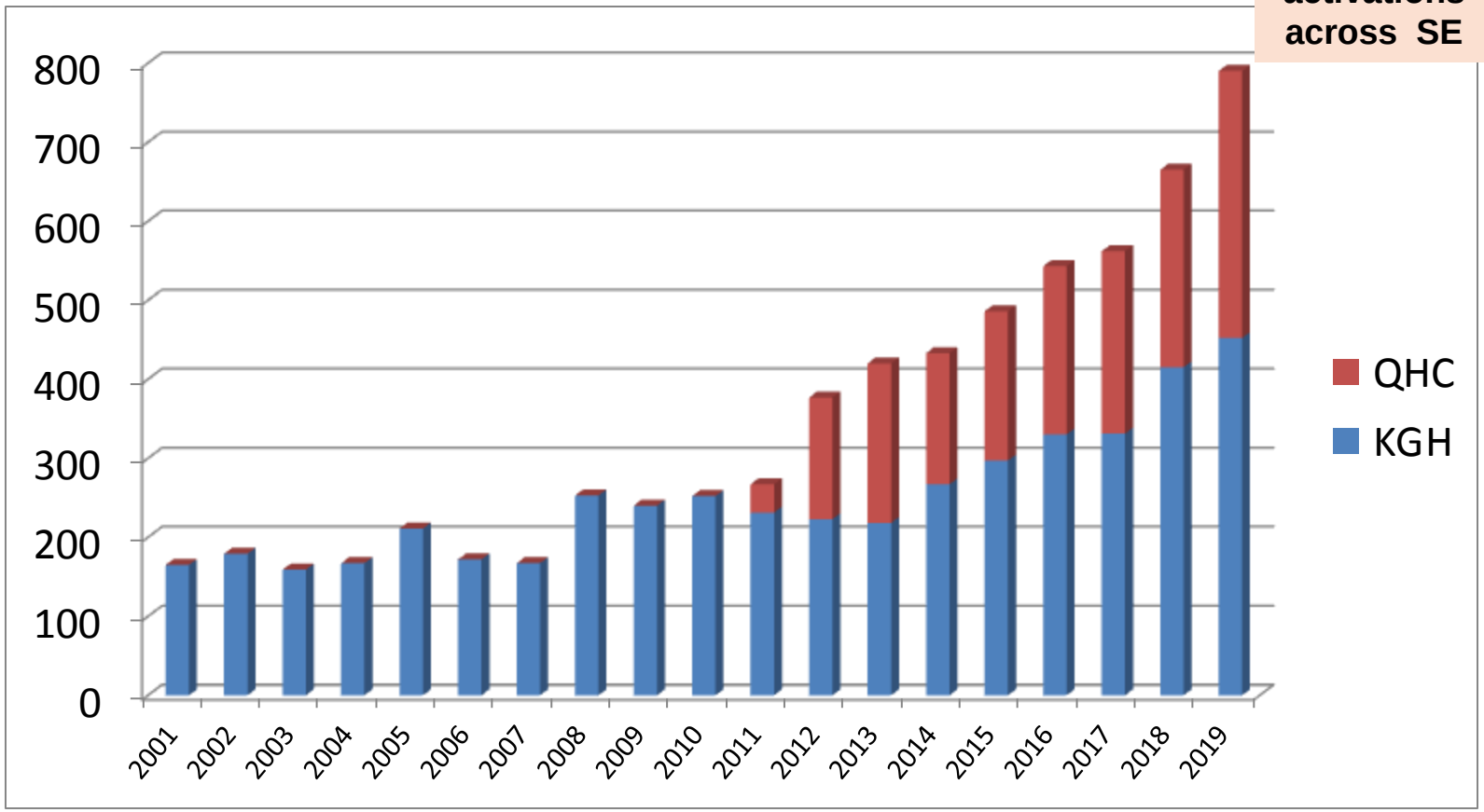
https://www.strokebestpractices.ca/

KGH + QHC

stroke protocol activations and tPA Volumes

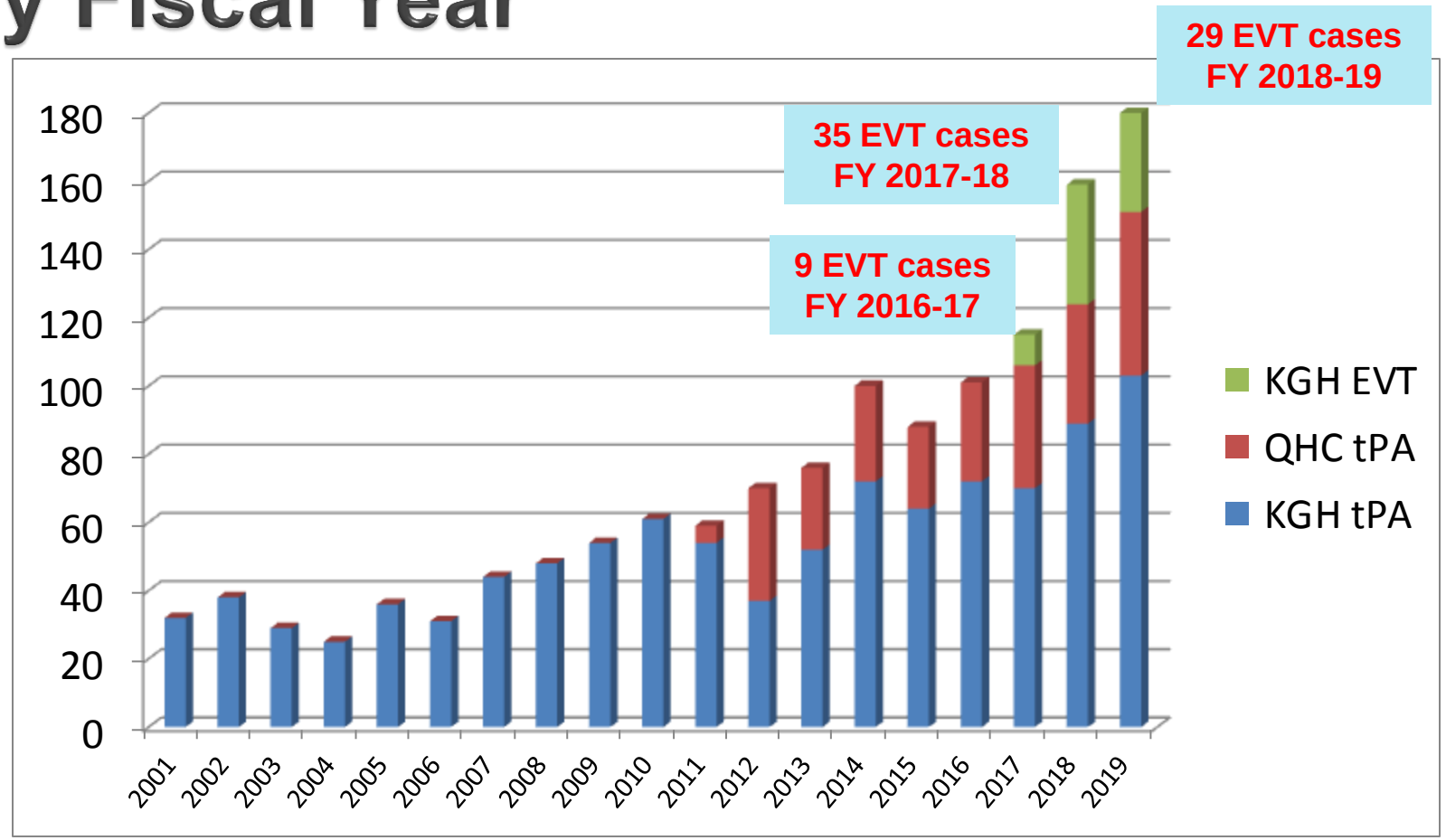
SEO ASP Activations KGH/QHC by Fiscal Year

Total of 790 activations across SE



2018-19 – In- hospital stroke protocol activations
41 at KGH; 23 at QHC = 64 increased from 49 last year

KGH/QHC tPA and EVT Volumes by Fiscal Year



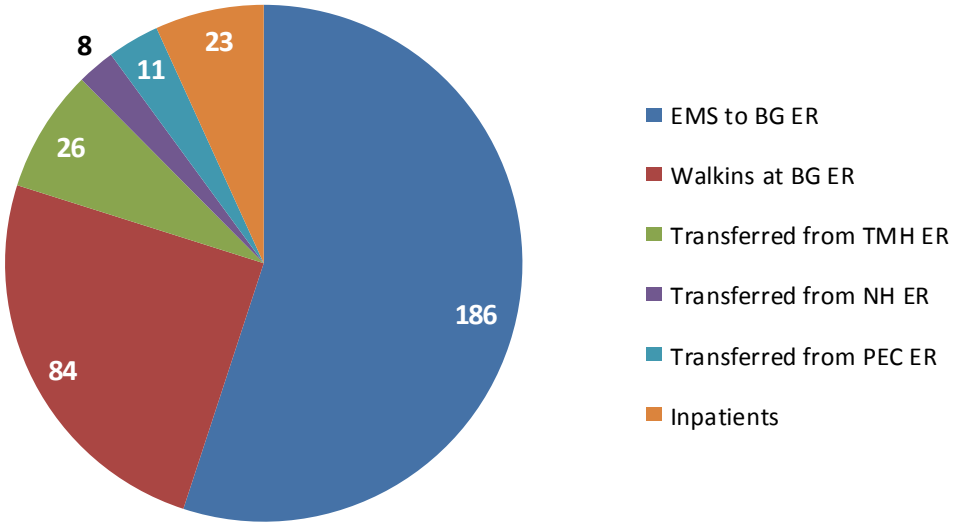
Median DTN times

2017-18 Report Card: KGH 24 mins; QHC 65 mins

2019-20 Local Data: KGH 25.5 mins; QHC 59.5 mins

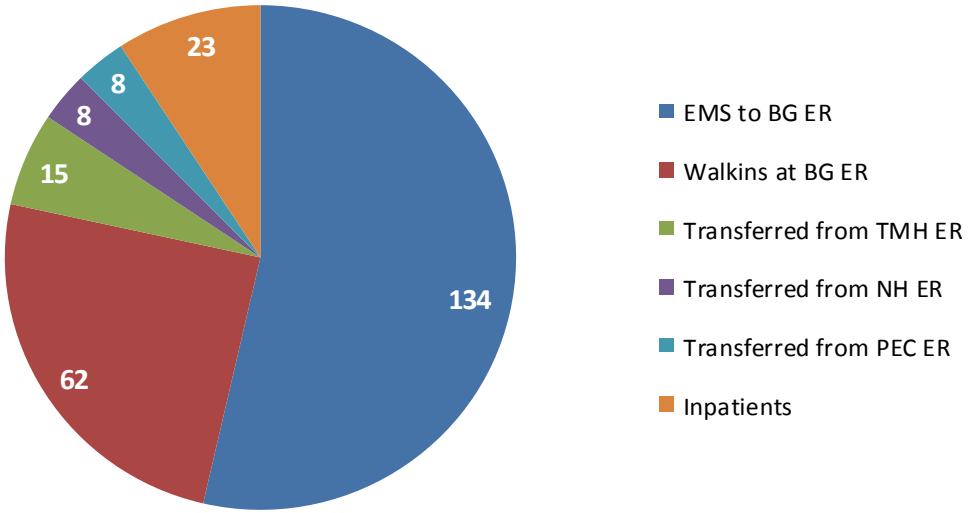
Key factors: EMS pre-notification; stay on EMS stretcher to CT; tPA in CT suite !!

QHC Code Stroke Activations (18/19)



QHC Data

QHC Code Stroke Activations (17/18)



QHC Plans for Kaizen Event

M. Roblin

Ontario Stroke Report Card

EMBARGOED until Public Release June 17th 2019

Ontario Stroke Evaluation FY 17-18

- CIHI administrative data
- CIHI 340 – stroke data

Ontario Stroke Report Card, 2017/18:
South East Local Health Integration Network

● Exemplary performance[1] ■ Acceptable performance[2] ▲ Poor performance[3] ☐ Data not available or benchmark not available

Indicator No.	Care Continuum Category	Indicator[4]	LHIN FY 2017/18 (2016/17)	Variance Within LHIN[5] (Min–Max)	Provincial Benchmark[6]	High Performers[7]	
						Sub-region/Facility	LHIN
1 ▲	Public awareness and patient education	Proportion of stroke/TIA patients who arrived at the ED by ambulance.	58.7% (62.0%)	57.8 - 59.3%	65.9%	Western Champlain sub-region	1, 11
2 ▲	Prevention of stroke	Annual age- and sex-adjusted inpatient admission rate for stroke/TIA (per 1,000 population).	1.6 (1.5)	1.4 - 1.8	1.1	Oakville sub-region	7, 8, 6
3§ ☐	Prevention of stroke	Risk-adjusted stroke/TIA mortality rate at 30 days (per 100 patients).	12.2 (11.1)	9.5 - 28.1	-	-	11
4 ▲	Prevention of stroke	Proportion of ischemic stroke/TIA inpatients aged 65 and older with atrial fibrillation who filled a prescription for anticoagulant therapy within 90 days of discharge from acute care.	71.0% (67.8%)	62.5 - 86.7%	85.6%	East Mississauga sub-region	5, 12
5 ■	Prevention of stroke	Proportion of ischemic stroke inpatients who received carotid imaging.	83.3% (85.3%)	33.3 - 92.6%	93.0%	Thunder Bay Regional Health Sciences Centre	14, 3
6 ●	Acute stroke management	Median door-to-needle time among patients who received acute thrombolytic therapy (tPA) (minutes). Target[8]: 30 minutes	31.5 (42.0)	24.0 - 65.0	33.0	Kingston Health Sciences Centre – Kingston General Site	10
7§ ●	Acute stroke management	Proportion of ischemic stroke patients who received acute thrombolytic therapy (tPA). Target[8]: >12%	14.4% (15.1%)	9.8 - 21.8%	17.7%	London Middlesex sub-region	11, 4
8§ ●	Acute stroke management	Proportion of stroke/TIA patients treated on a stroke unit[9] at any time during their inpatient stay. Target[8]: >75%	80.5% (76.7%)	74.8 - 88.8%	81.8%	Quinte sub-region	3, 10
9 ■	Prevention of stroke	Proportion of ischemic stroke/TIA patients discharged from the ED and referred to secondary prevention services.	79.1% (74.7%)	0.0 - 100.0%	95.1%	Hamilton Health Sciences Corp - Juravinski	None
10§ ▲	Acute stroke management	Proportion of ALC days to total length of stay in acute care.	33.0 (32.1)	0.0 - 72.8%	8.2%	Bluewater Health, Sarnia	3
11§ ▲	Acute stroke management	Proportion of acute stroke (excluding TIA) patients discharged from acute care and admitted to inpatient rehabilitation. Target[8]: >30%	30.2% (27.9%)	14.5 - 36.0%	47.8%	Lambton sub-region	1
12§ ☐	Stroke rehabilitation	Proportion of acute stroke (excluding TIA) patients with mild disability (AlphaFIM > 80) discharged home.	75.9% (80.0%)	73.9 - 84.1%	*	*	14, 3
13§ ▲	Stroke rehabilitation	Median number of days between stroke (excluding TIA) onset and admission to stroke inpatient rehabilitation.	11.0 (11.0)	4.0 - 15.0	5.0	Quinte Health Care – Belleville General Site	None
14§ ■	Stroke rehabilitation	Median number of minutes per day of direct therapy received by inpatient stroke rehabilitation patients. Target[8]: 180 minutes/day	74.9 (71.5)	72.4 - 80.0	107.6	West Park Healthcare Centre	None
15§ ▲	Stroke rehabilitation	Proportion of inpatient stroke rehabilitation patients achieving RPG active length of stay target.	50.7% (51.3%)	40.0 - 62.4%	86.6%	Providence Healthcare	12
16 ▲	Stroke rehabilitation	Median FIM efficiency for moderate stroke in inpatient rehabilitation.	1.0 (0.9)	0.8 - 1.6	1.6	Providence Healthcare	3, 12
17 ●	Stroke rehabilitation	Mean number of home and community care rehab visits provided to stroke patients on discharge from inpatient acute care or inpatient rehabilitation in 2016/17–2017/18.	15.3 (12.9)	-	13.1	South East Home and Community Care	10, 3
18§ ▲	Stroke rehabilitation	Proportion of patients admitted to inpatient rehabilitation with severe stroke (RPG 1100 or 1110).	35.7% (45.7%)	20.0 - 40.9%	56.2%	Grand River Hospital Corp-Freeport Site	None
19§ ■	Reintegration	Proportion of stroke/TIA patients discharged from acute care to LTC/CCC (excluding patients originating from LTC/CCC).	3.9% (6.4%)	1.0 - 6.5%	1.9%	Guelph-Puslinch sub-region	None
20§ ☐	Reintegration	Age- and sex-adjusted readmission rate at 30 days for patients with stroke/TIA for all diagnoses (per 100 patients). Target[8]: 10.0	6.6 (5.1)	5.2 - 11.0	-	-	10

*Benchmark has not been specified for this indicator.

Hospital Service Accountability Agreement indicator, 2015/16

- Data not available

§ Contributes to QBP performance

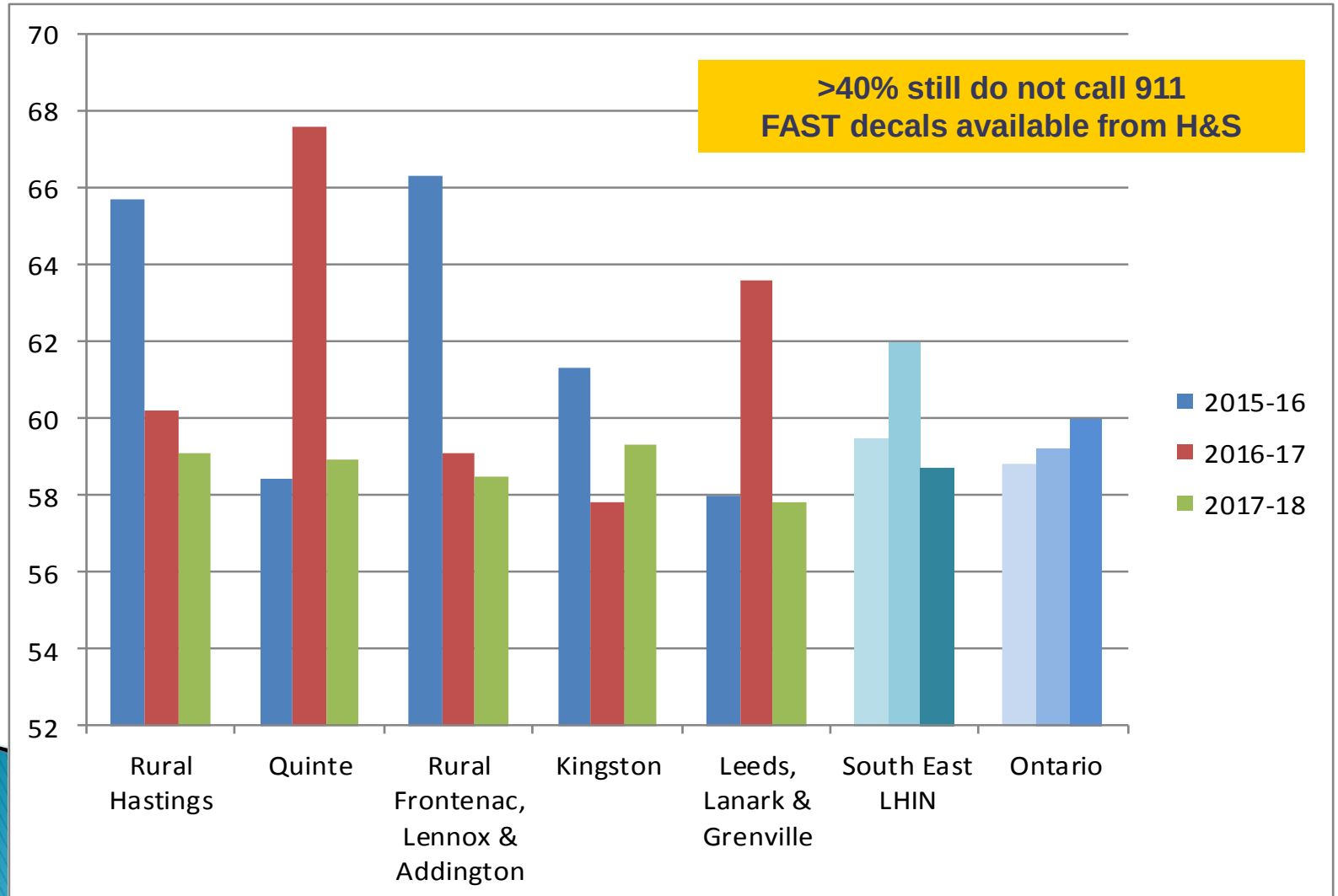
[1] Benchmark achieved or performance within 5% absolute/relative difference from the benchmark.
[2] Performance at or above the 50th percentile and greater than 5% absolute/relative difference from the benchmark.
[3] Performance below the 50th percentile.
[4] Facility-based analysis (excluding indicators 1, 2, 4, 7, 8, 11 and 19) for patients aged 18–108. Indicators are based on CIHI data. Low rates are desired for indicators 2, 3, 6, 10, 13, 19 and 20.
[5] Excludes sub-regions or facilities with fewer than six patients.
[6] Top benchmark achieved between 2015/16 and 2017/18. Benchmarks were calculated using the ABC methodology (Weissman et al. J Eval Clin Pract 1999; 5(3):269–81) on sub-region or facility data.
[7] Sub-region/Facility: Highest performer among acute care institutions treating more than 100 stroke patients per year, rehabilitation facilities admitting more than 62 stroke patients per year, or sub-regions with at least 30 stroke patients per year. LHIN: Top two with exemplary performance.
[8] Targets based on international, national and provincial targets, please refer to full report for details.
[9] The revised definition was developed with the consensus of Ontario Stroke Network regional directors (February 2014). There were 16 stroke units in 2013/14, 21 in 2014/15, 28 in 2015/16, 35 in 2016/17, and 39 in 2017/18

CorHealth Ontario

STROKE NETWORK of Southeastern Ontario

% All Stroke Transported by Ambulance

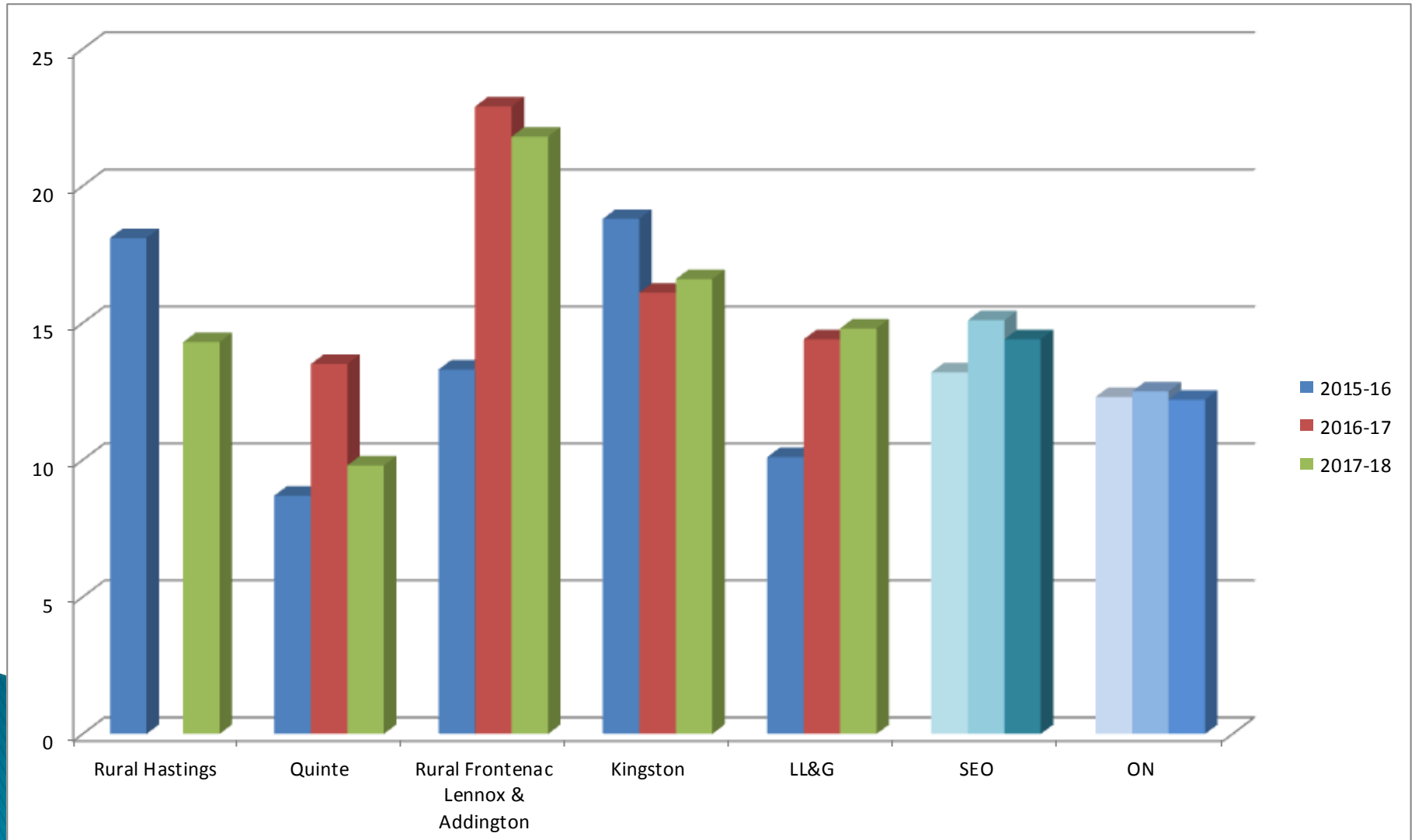
Source: CIHI NACRS FY 2016-17-18 - population based



STROKE NETWORK of Southeastern Ontario

% Thrombolysis Among Ischemic Strokes

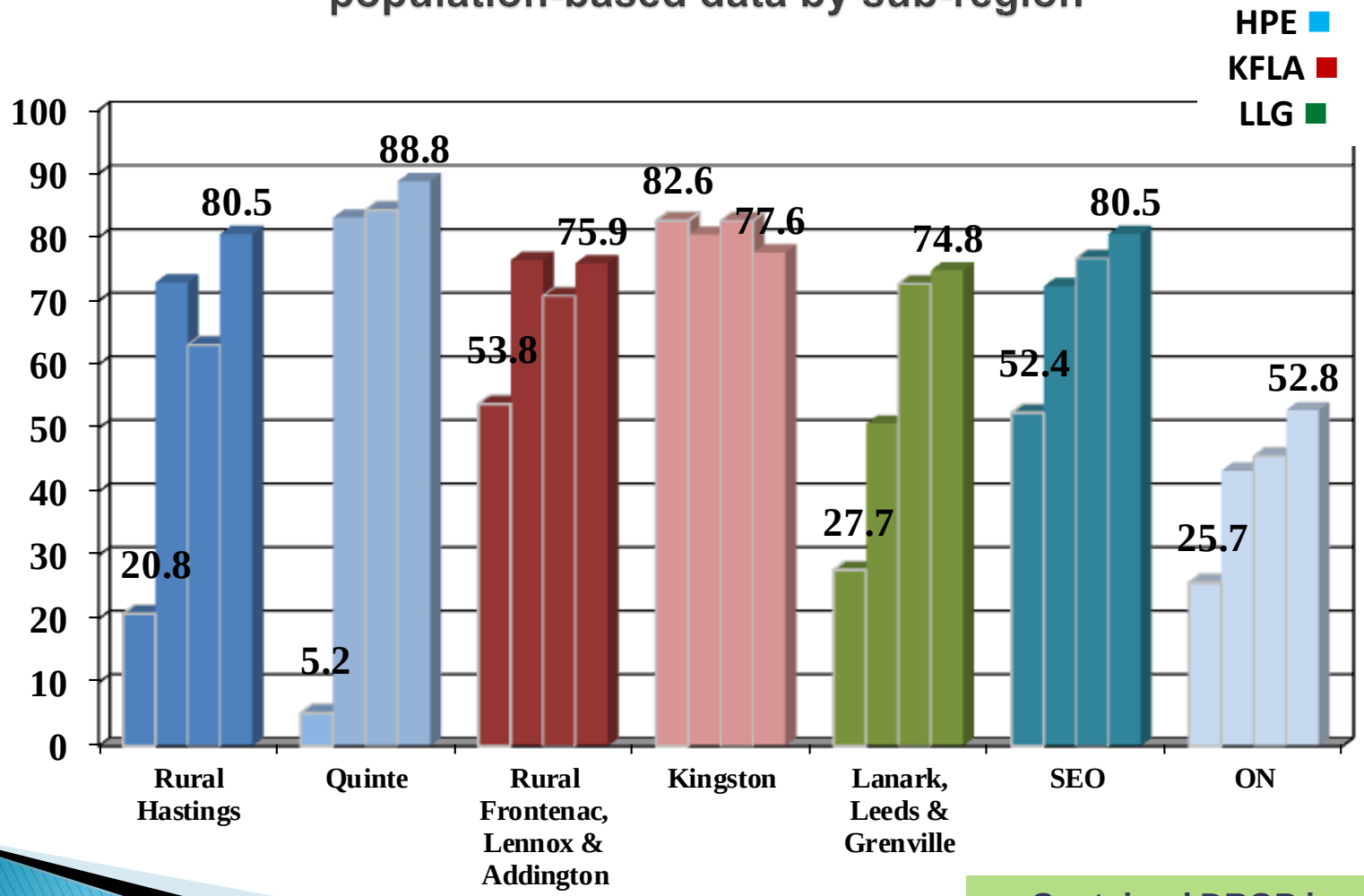
Source: CIHI NACRS FY 2016-17-18 – population based



STROKE NETWORK *of* Southeastern Ontario

% Accessing Acute Stroke Unit Care

Source: CIHI 340 FY 2012-13 compared to 2015-16, 16-17 and 17-18 population-based data by sub-region



Sustained DROP in stroke mortality rate

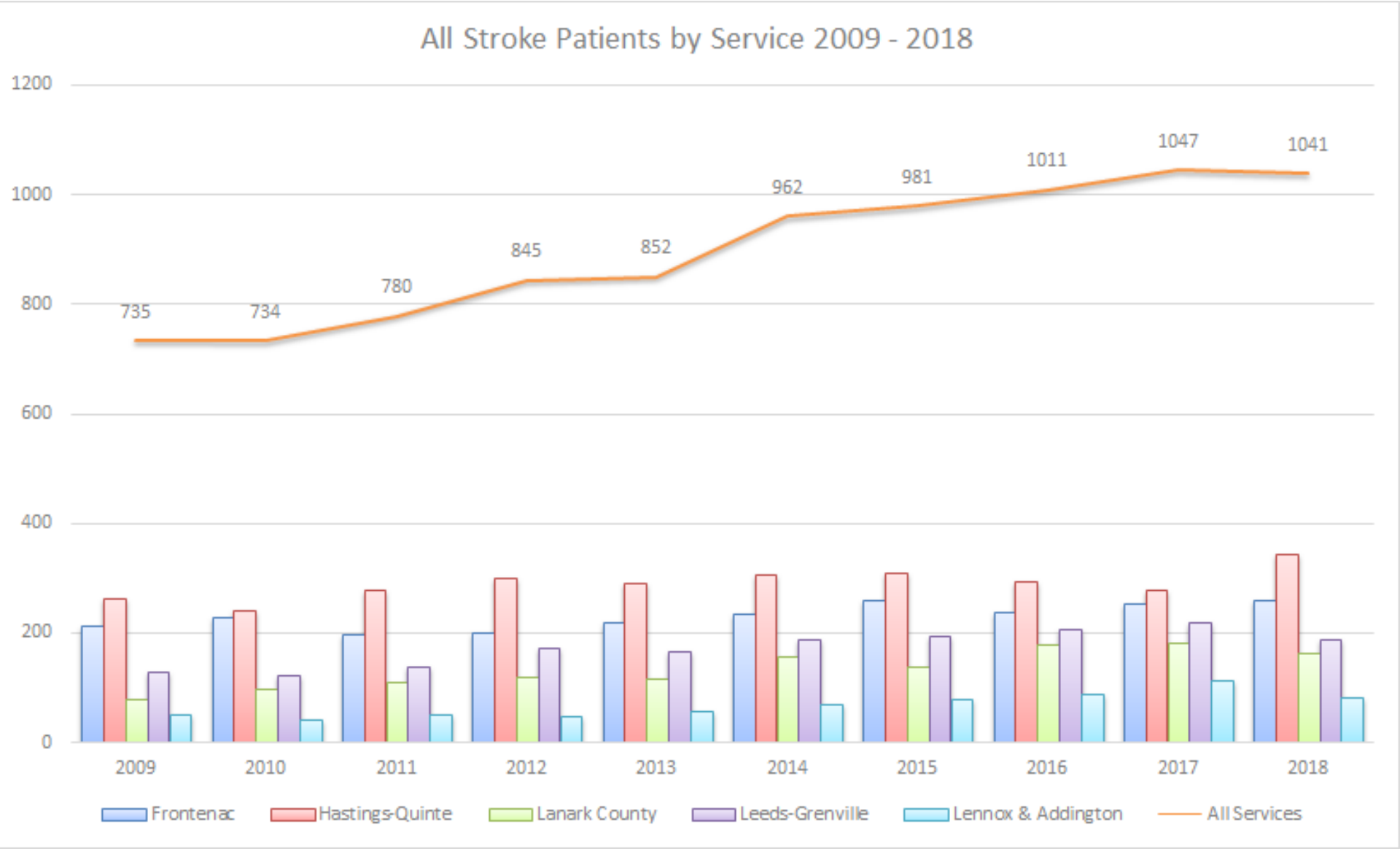
Regional Paramedic Program for Eastern Ontario

Regional Paramedic Program for Eastern Ontario

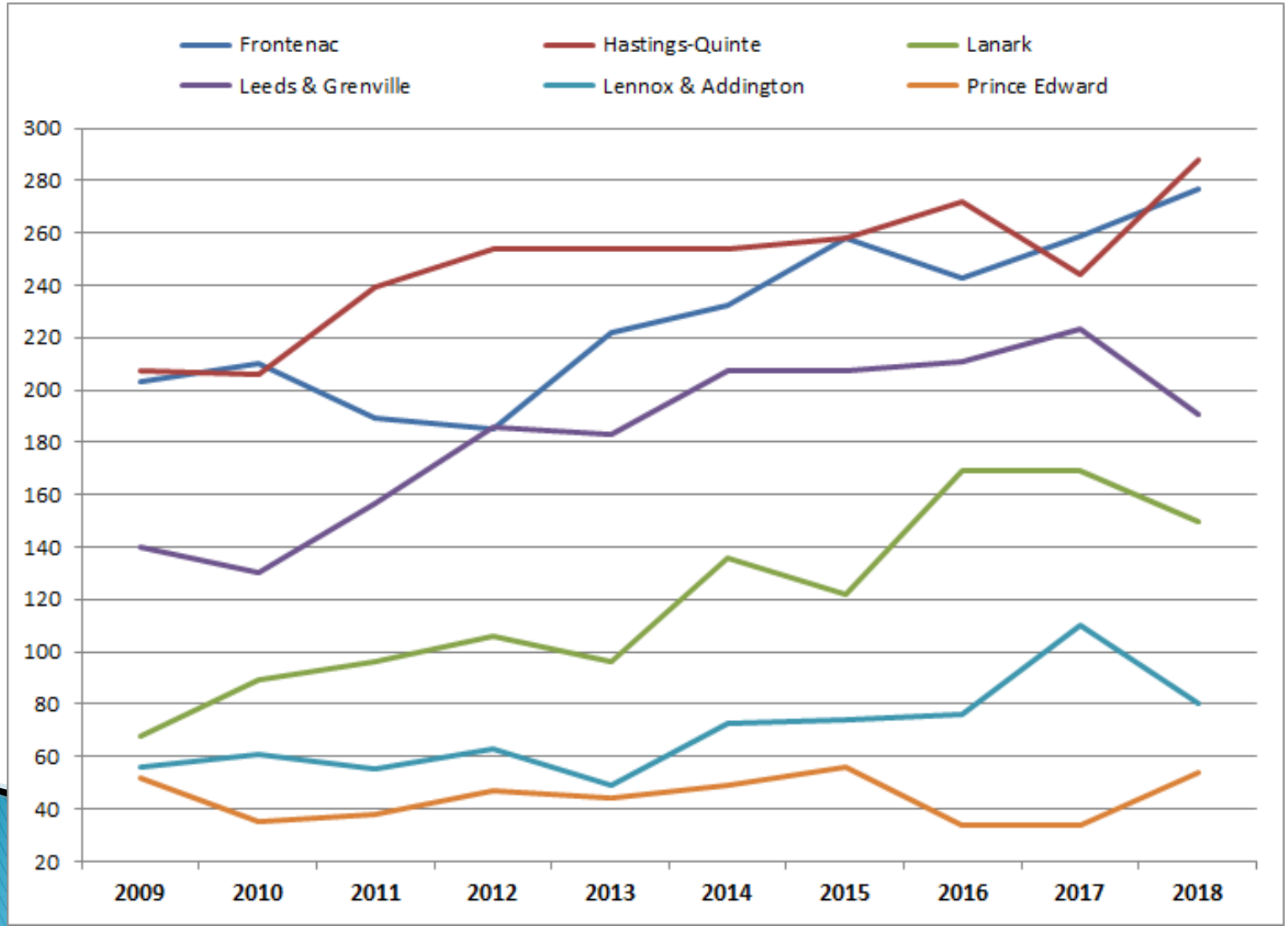
Stroke Report 2018

Calendar Year 2018 – with thanks to Susan Duncan and Ben De Mendonca

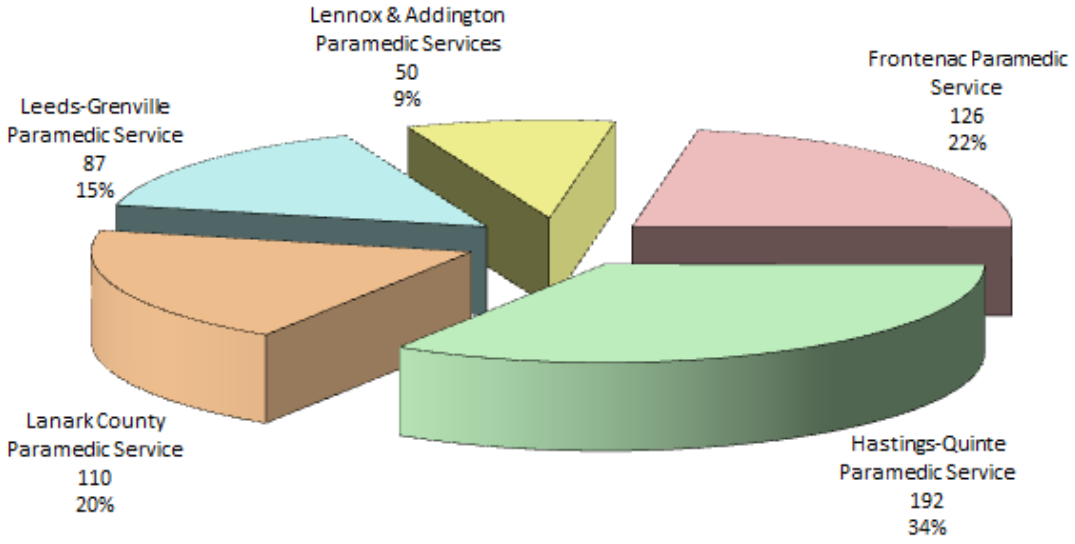
All Stroke Patients by Paramedic Service x 10 yrs



Growth in Stroke Protocols by Service – past 10 years



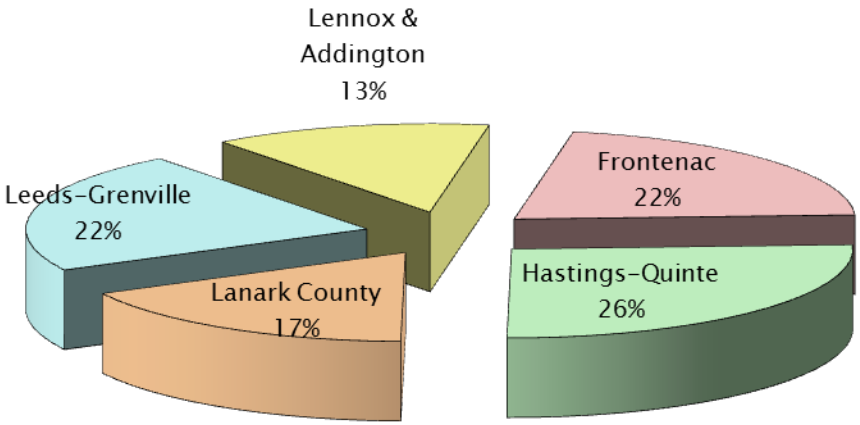
ACUTE STROKE PROTOCOL PATIENTS IN 2018 (N=565)
BY RESPONDING PARAMEDIC SERVICE



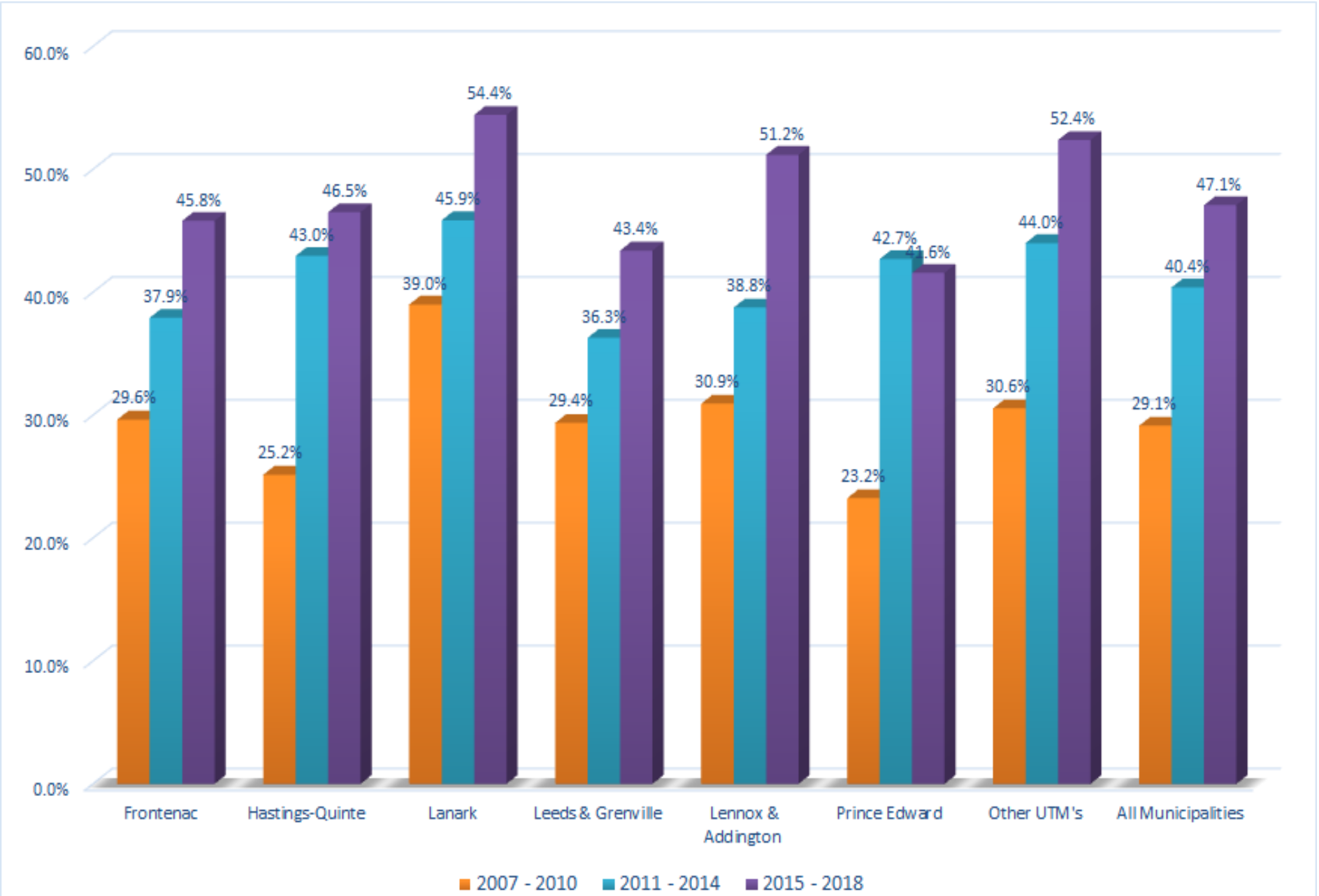
2018 ASP stroke calls by location N=565

2017 ASP stroke calls by location N=508

ACUTE STROKE PROTOCOL (N=508)
RESPONDING AMBULANCE SERVICE



% OF STROKE PATIENTS IN EACH COUNTY WHO WERE ACUTE STROKE PROTOCOLS



Transfers vs Bypass 2010-2018

	2011	2012	2013	2014	2015	2016	2017	2018
Stroke Centre is closest	129 (44%)	161 (46%)	176 (49%)	165 (43%)	165 (41%)	183 (41%)	191 (38%)	220 (39%)
Bypass	115 (39%)	133 (38%)	146 (41%)	135 (35%)	168 (42%)	183 (41%)	210 (41%)	224 (40%)
Transfers	**49 (17%)**	**56 (16%)**	**38 (11%)**	**86 (22%)**	**66 (17%)**	**82 (18%)**	**107 (21%)**	**121 (21%)**
TOTAL	**293**	**350**	**360**	**386**	**400**	**448**	**508**	**565**

Reasons for the transfers in 2018:

- **72 were brought by private car (60%)**
- **25 In-hospital strokes**
- **23 brought to local ED – 11 of these related to time of onset**
- **1 EVT**

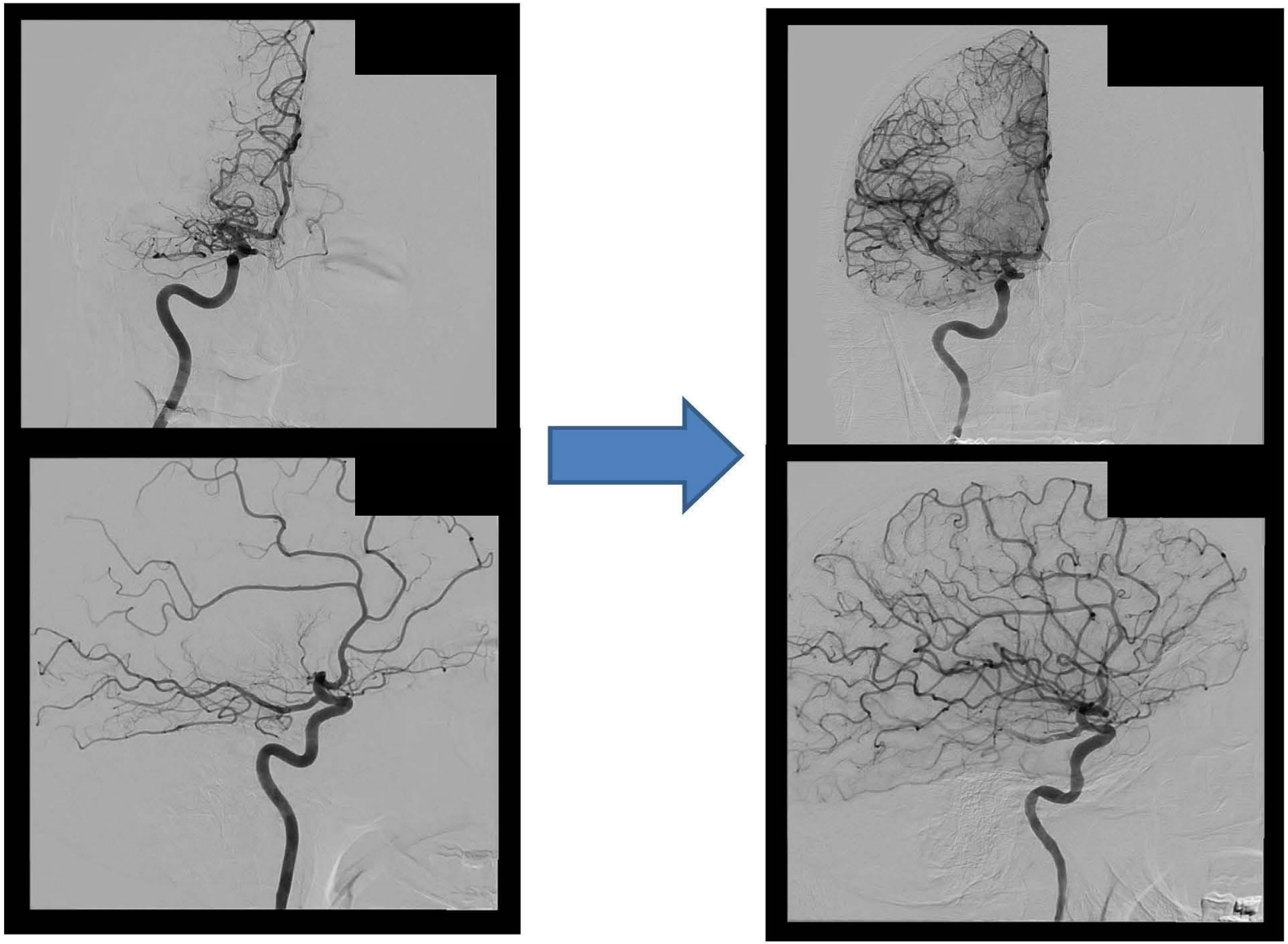
Home location for the 72 patients arriving by car

Almonte 5	Napanee 3
Bancroft 5	Perth 11
Brockville 6	Picton 5
Carleton Place 4	**Smiths Falls 14**
Kemptville 7	Trenton 7
Kingston 5	

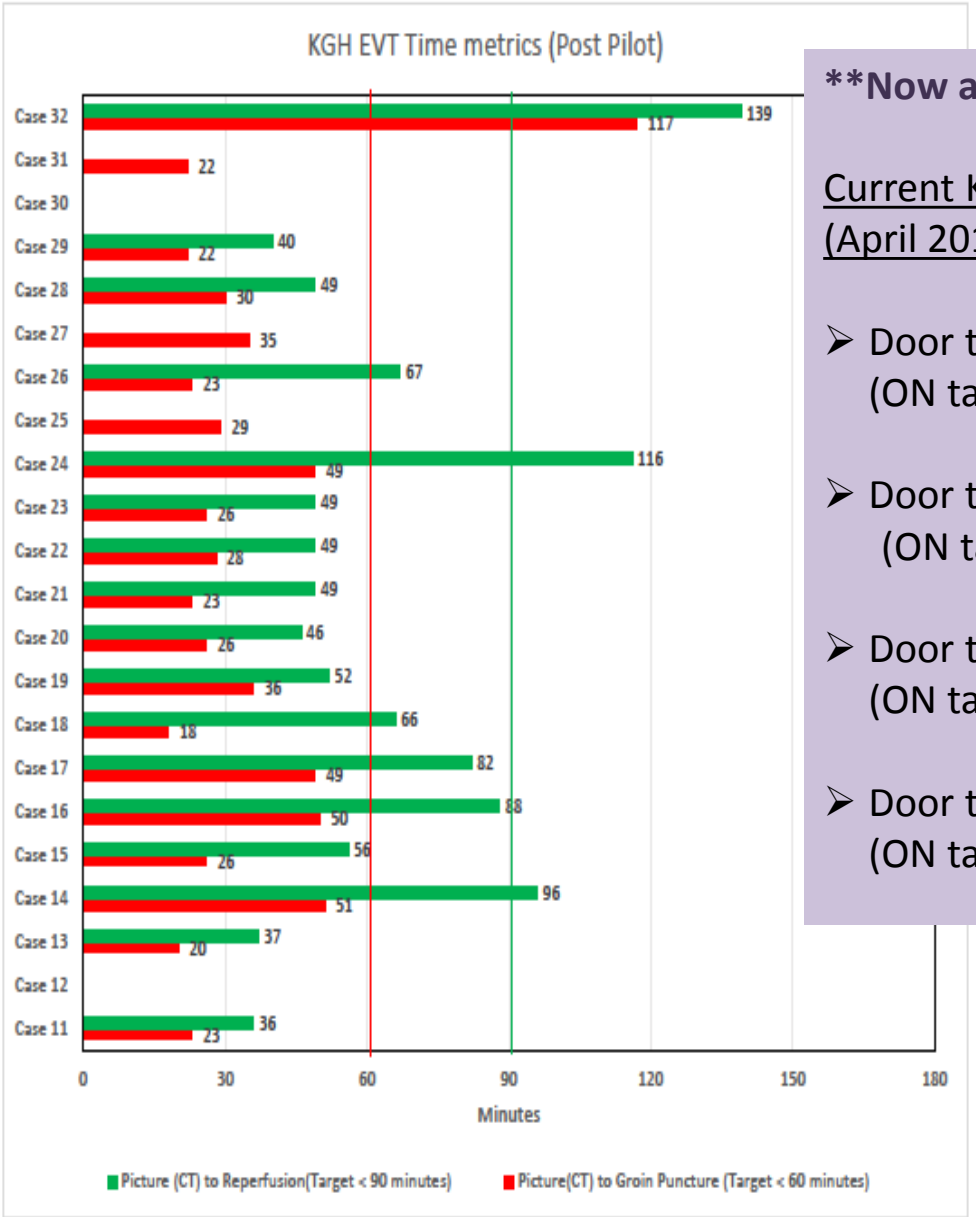
Contraindications for transport under ASP – CY 2018

Unable to determine when patient last seen normal					46
Unable to deliver patient to stroke centre within timeline					145
	4.5 – 6 hrs (prior March)	2			
	6 – 12 hours	66			
	12 – 24 hours	54			
	greater than 24 hours	23			
Patient was unconscious or unstable					13
Terminally ill or palliative care patient					9
Seizure at onset of symptoms					21
Symptoms resolved prior to paramedic departing scene					237
Symptoms mild					4
Patient refused					1
Total					476

KHSC EVT Outcomes to Date



KHSC Current Process Times



****Now approaching 90th case****

<u>Current KHSC median times (April 2018 to March 2019)</u> :

- Door to CT: **12 mins** (ON target 15 mins)
- Door to Needle: **26 mins** (Q3/Q4) (ON target 30 mins)
- Door to Puncture: **37 mins** (ON target 60 mins)
- Door to First Reperfusion: **55 mins** (ON target 90 mins)

Kingston Health Sciences Centre

Centre des sciences de la santé de Kingston

KHSC Current Outcomes

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

TOTAL of 79 cases to March 31 2019: 73 Anterior and 6 posterior

<u>Most recent analysis April 2018 to March 2019:</u>

26 anterior cases, 3 posterior circulation cases

- ~2 cases per month
- Geographic distribution: HPE – 9; KFLA – 13 (2 from L&A); LLG – 7
- 11 cases treated after hours; slightly more than half received tPA
- Average age 71.5 years (46 to 92 years); 17 female/12 male

<u>For the 26 anterior cases April 2018 to March 2019</u>

- 12/26 (46.2%) with minimal to no disability
- 4/26 (15.4%) with moderate disability
- 5/26 (19.2%) with severe disability
- 5/26 (19.2%) mortality (half stroke-related; half not - cardiac, PE etc.)

Hôpital Hotel Dieu Hospital

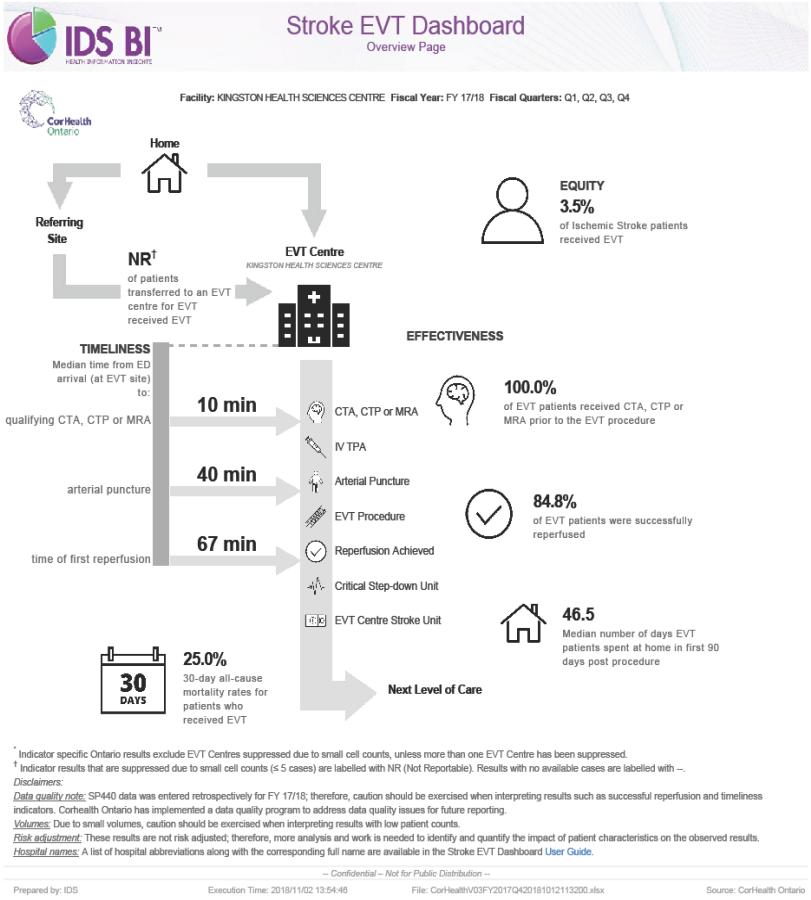
Hôpital Général de Kingston General Hospital

Kingston Health Sciences Centre

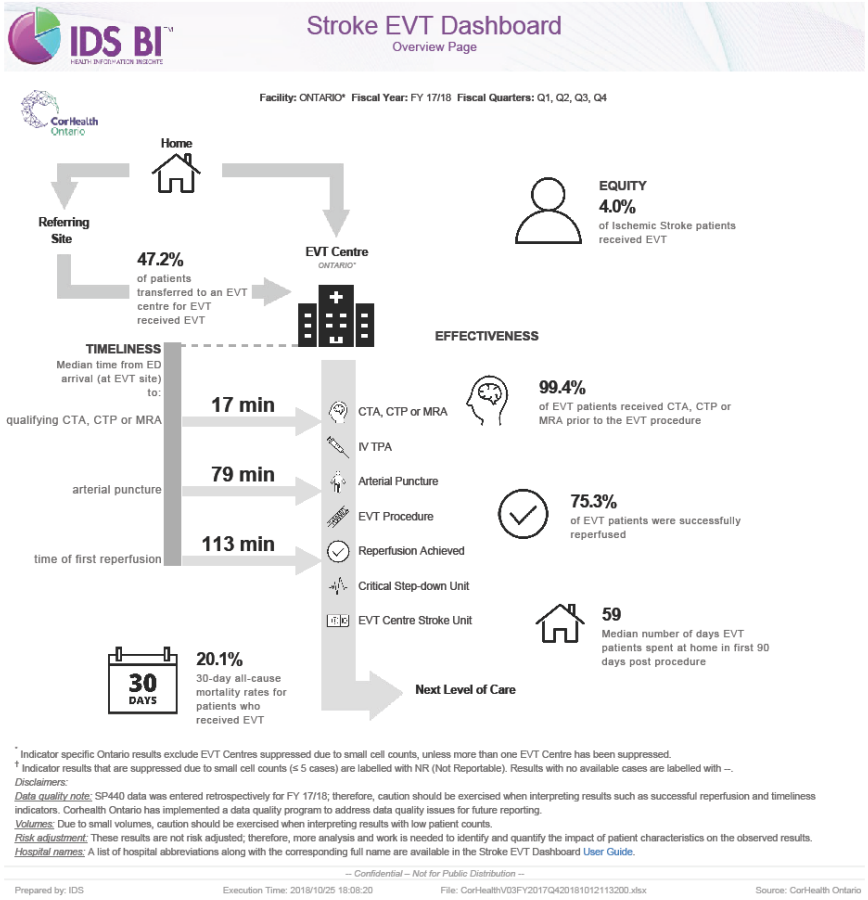
Centre des sciences de la santé de Kingston

First CorHealth Ontario EVT Report Released Oct 24th 2018

Kingston



Ontario



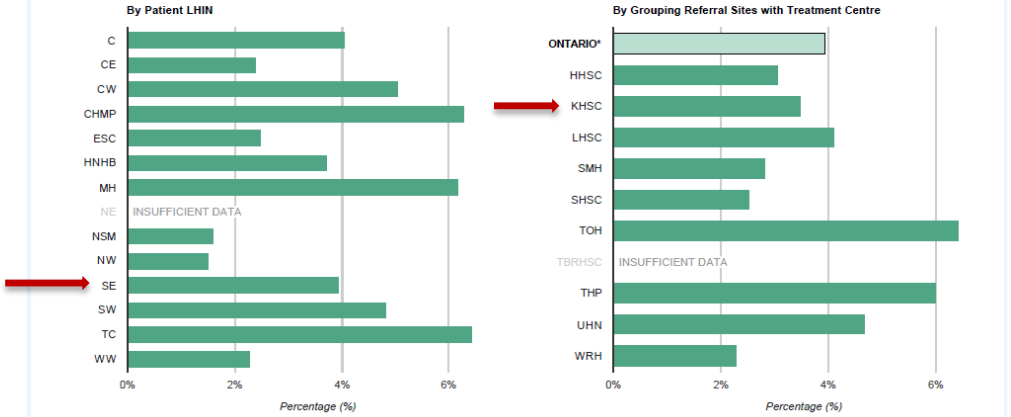
First CorHealth Ontario EVT Report Released Oct 24th 2018

ACCESS

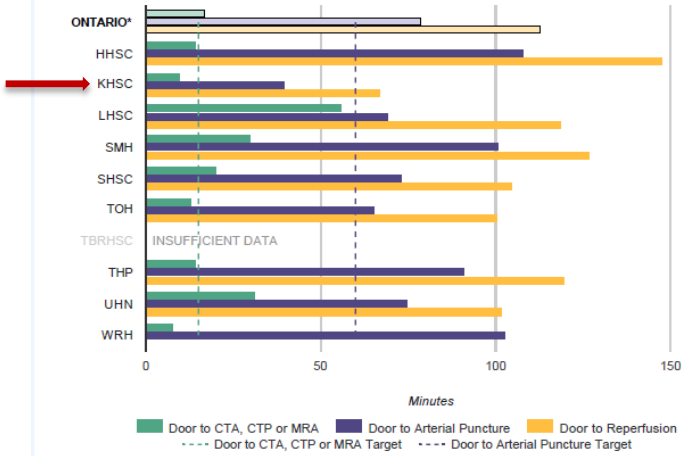
PROCESS

OUTCOMES

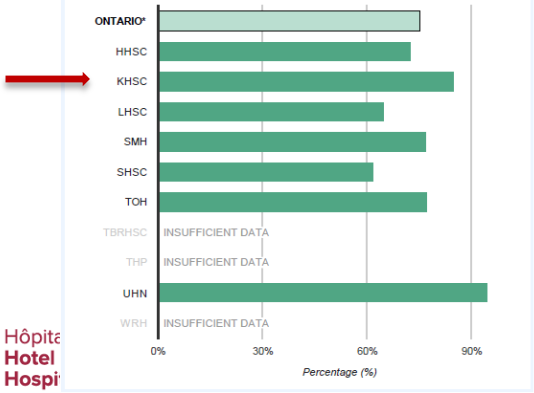
Proportion of ischemic stroke patients who receive an EVT procedure



Median time from ED arrival (at EVT site) to qualifying CTA, CTP or MRA, Arterial Puncture, and Reperfusion

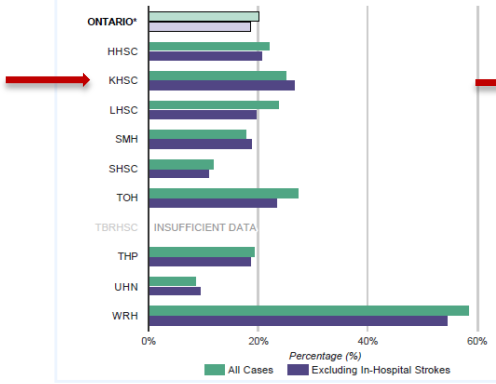


Proportion of EVT patients successfully reperfused



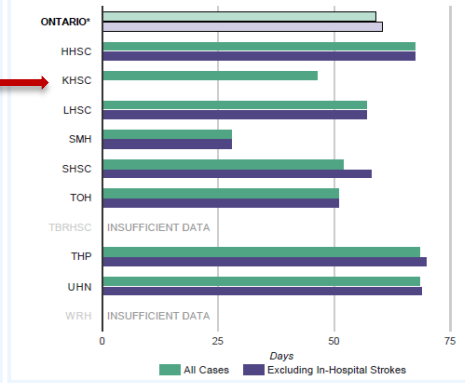
Biannual trend - Proportion of patients successfully reperfused

30-day all-cause mortality rates for patients who received EVT



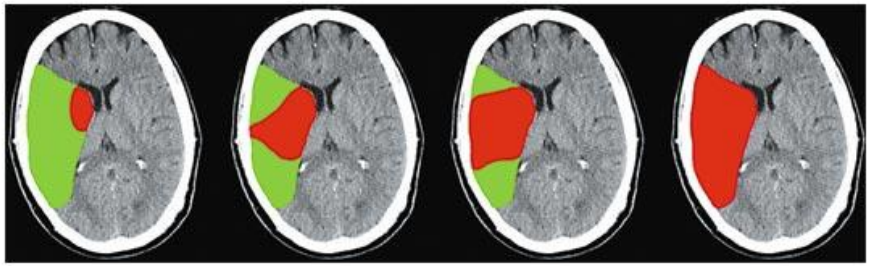
Biannual trend - Percentage of deaths (All Cause) at 30 days post EVT

Median number of days EVT patients spent at home in the first 90 days post procedure



Biannual trend - Median days at home 90 days post procedure

KHSC EVT Updates



- DAWN and DEFUSE-3 trials indicate extended time window for EVT beyond 6 hours in select cases
- Hyperacute Best Practice Guidelines summer 2018 include expanded time window for EVT
- Eligibility based on quantifiable measure of mismatch between ischemic core and penumbra
- “RAPID” advanced CT perfusion software installed Jan 2019 allows evidence-based approach
- Cases can now be selected for EVT beyond 6 hours
- NOTE: Quinte has also recently purchased “RAPID” software and will be installing in near future.

Paramedic Prompt Card Update

&

Revisions to Walk-in Protocols: “ACT-FAST” screening tools for use in 6-24 hour timeframe

BLS 3.2 Stroke Paramedic Prompt Card Update: as of Sept 1st 2019: *"most appropriate centre"*

Emergency Health Regulatory and Accountability Branch

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). Please refer to the BLS PCS for the full protocol.

Indications under the Acute Stroke Protocol

Redirect or transport to the closest or most appropriate Designated Stroke Centre* will be considered for patients who meet **ALL** 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.

*A Designated Stroke Center is a Regional Stroke Centre, District Stroke Centre or a Telestroke Centre regardless of EVT capability.

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.

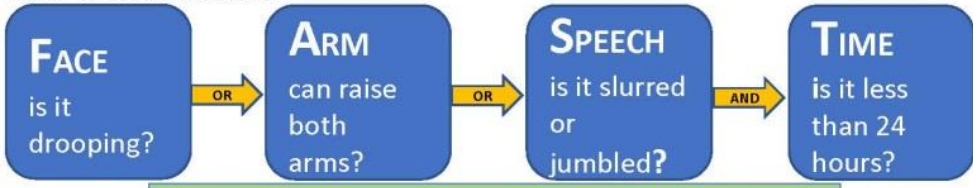
CACC/ACS will authorize the transport once notified of the patient's need for redirect or transport under the Acute Stroke Protocol.

Ontario

TRIAGE TOOLs for Acute Stroke < 24 hours

STROKE NETWORK of Southeastern Ontario

FAST Stroke Screen:



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

IF ≤ 6 hours, refer to Paramedic Prompt Card
IF 6 - 24 hours, during transport to closest ED complete **ACT-FAST**

ACT-FAST Stroke Screen:

"ARM" (one-sided arm weakness)

Position both arms at 45⁰ 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

During transport, notify destination ED of Positive **ACT-FAST** between 6-24 h

2019-05-13

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

- 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

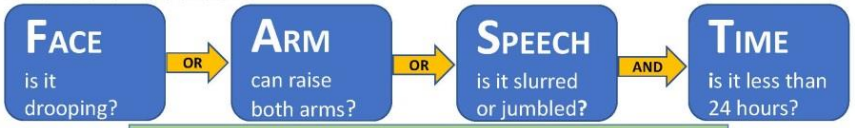
USED by PARAMEDIC

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

TRIAGE TOOLs for Acute Stroke < 24 hours

STROKE NETWORK *of* Southeastern Ontario

FAST Stroke Screen:



- ✓ 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

USED by ED STAFF

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

Walk-in protocol revision:

- L&ACGH
- Brockville
- PSFDH
- HDH site

Acute Stroke Protocol of Southeastern Ontario 11/04/2019

Emergency Transfer Guide
Patients who present with features of an acute ischemic stroke may be eligible for thrombolytic therapy and/or endovascular thrombectomy at Kingston General Hospital.

Inclusion Criteria

- ☐ Patient is suspected of having ischemic stroke.
- ☐ Clear and credible time of symptom onset can be established and patient can reach KGH:
  - Within 6.0 hours of onset
    OR
  - Within 6-24 hours of onset if ACT-FAST screen is positive

  *Time of onset is the time patient was last seen well.
  *Time is Brain. The sooner patient arrives at KGH, the greater potential for better outcomes.
  *KGH Stroke team requires 1 hour from KGH ED door to treatment.
- ☐ Pregnancy is **NOT** a contraindication.
- ☐ Age < 18 years is **NOT** a contraindication.

Exclusion Criteria

- ☐ Unknown onset of symptoms or patient last seen well > 24hours.
- ☐ Complete resolution of neurological signs (TIA).
- ☐ Serious co-morbidity with limited lifespan (e.g., advanced cancer, advanced dementia).
- ☐ If uncertain about whether patient meets Acute Stroke Protocol criteria, contact Neurologist on Call for Stroke at KGH

The following steps are recommended if the patient meets eligibility criteria and is stable for transfer:

Step 1 Arrange for ambulance transfer by calling dispatch.
Inform the dispatcher that patient fits **"Acute Stroke Protocol"**

Step 2 Call KGH Emergency Department. Ask to speak to the Charge Nurse and inform them you have a patient that meets the **"Acute Stroke Protocol"**

Phone (613) 549-6666 extension 7003

Step 3 Complete the following if time permits **(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

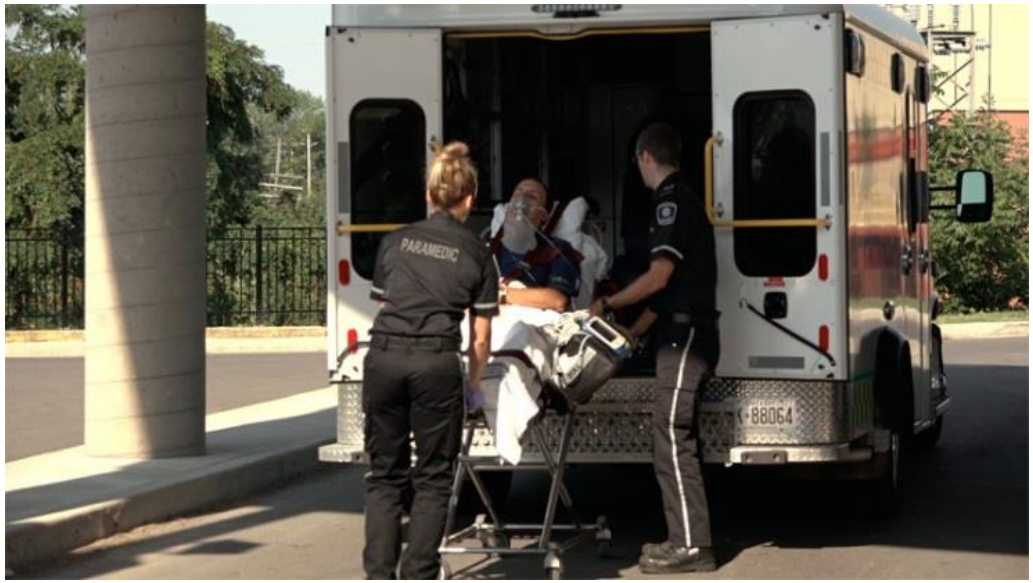
B. Optional (If time still permits):
- CBC, electrolytes, urea, creatinine, troponin, INR, PTT, glucose, pregnancy test (βHCG) if indicated
- ECG

Step 4 Fax blood work and all relevant patient information to KGH Emergency Department:

Fax (613) 548-2420

Walk-in protocol revision Quinte in progress - TBD:

- Bancroft
- Trenton
- Picton
- Belleville

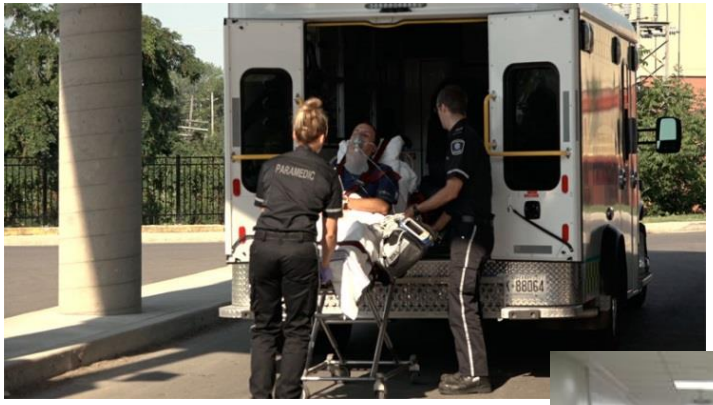


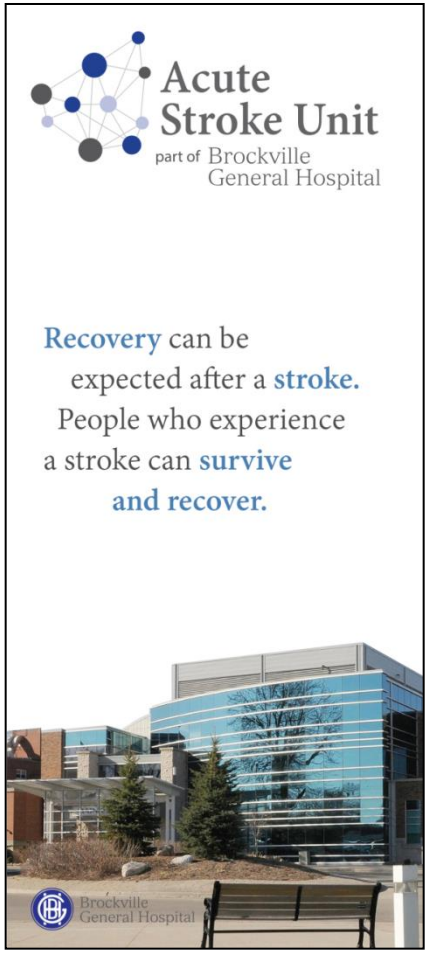
Final reminders!!

- Feedback welcome on pilot experiences
- Dispatch considerations for walk-in protocols
- Importance of early pre-notification

Roundtable updates

THANK YOU!





www.strokenetworkseo.ca