

Persistence of Poor Thrombolysis Rates for Ischemic Stroke in NL

Canadian Stroke Best Practice Recommendation

Administer intravenous thrombolytics within 4.5 hours of ischemic stroke onset.

Objective

To determine whether interventions to improve thrombolysis rates for ischemic stroke in the province had succeeded.

Practice Points

1. Thrombolysis with tissue plasma activator (tPA) is a proven intervention that will improve outcomes in ischemic stroke but needs to be provided within 4.5 hours of symptom initiation.
2. Thrombolysis rates were poor (<10%) in NL prior to 2017. Knowledge translation efforts by Quality of Care NL, implementation team visits to Regional Health Authorities (RHAs) by content experts, and initiation of an e-record for stroke patients in emergency rooms occurred in 2017–19 with the objective of improving thrombolysis rates to over 20%.
3. The pathway to thrombolysis involves multiple steps: recognition of symptoms, paramedics and transport, ER response, CT to diagnose ischemic stroke, and administration of tPA. Delay in any step can limit thrombolysis use.

Data (PI: P.B. Parfrey)

Aggregate thrombolysis rates by RHA were obtained from the NL Centre for Health Information (NLCHI) using the data from project 340 on management of stroke in the province from 2014–15 to 2019–20. For Eastern Health (EH), patient level data were analysed by hospital for the same period.

Results

- In the province in 2018–19, there were 1,204 strokes, 69.4% (N=836) of which were ischemic, and the remainder (N=368) hemorrhagic.

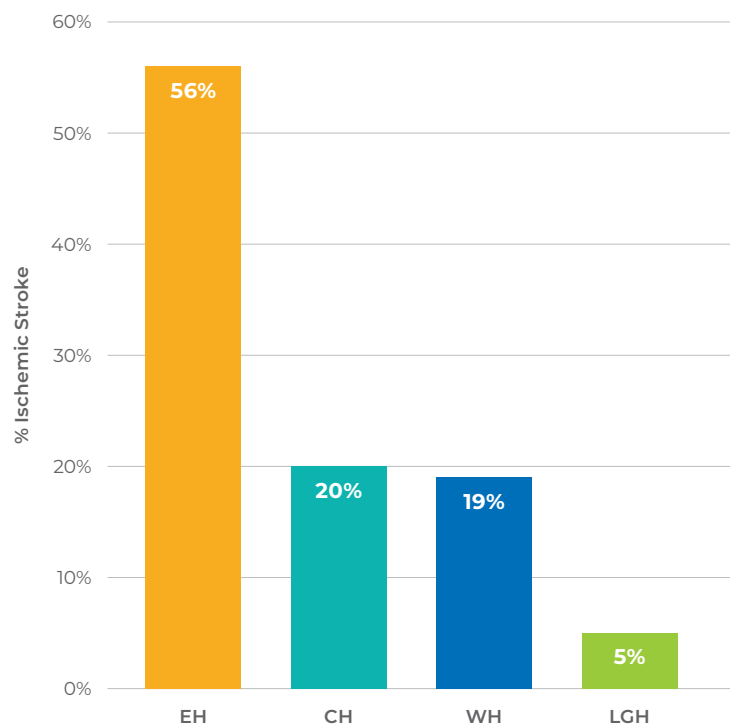
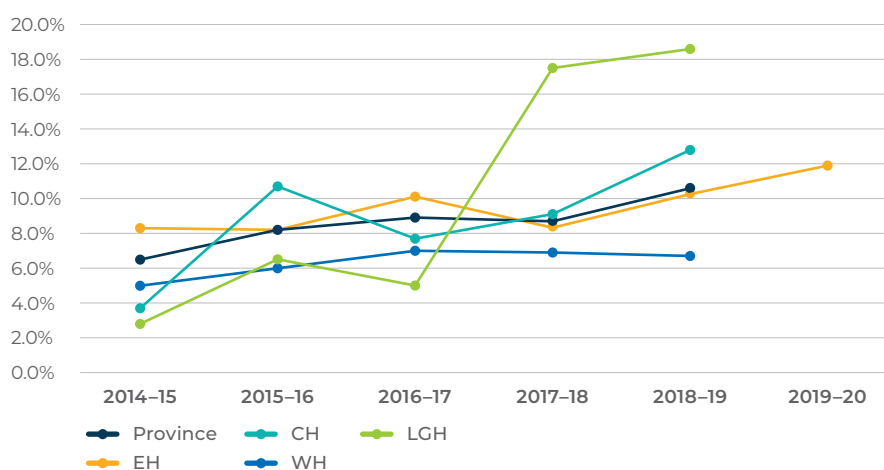


Figure 1. Per Cent of Ischemic Strokes by RHA for 2018–19

- 56% of ischemic strokes occurred in EH, which has 60% of the population.

Table 1. The Number of Ischemic Strokes and the Number Who Received Thrombolysis in Each RHA From 2014–2020 by RHA

RHA of Service	Fiscal Year											
	2014–15		2015–16		2016–17		2017–18		2018–19		2019–20	
	N	tPA	N	tPA	N	tPA	N	tPA	N	tPA	N	tPA
Eastern Health	355	8.3%	440	8.2%	436	10.1%	415	8.4%	486	10.3%	547	11.9%
Central Health	119	3.7%	128	10.7%	132	7.7%	127	9.1%	171	12.8%	N/A	N/A
Western Health	153	5.0%	138	6.0%	142	7.0%	134	6.9%	155	6.7%	N/A	N/A
Labrador-Grenfell Health	34	2.8%	29	6.5%	36	5.0%	34	17.5%	42	18.6%	N/A	N/A



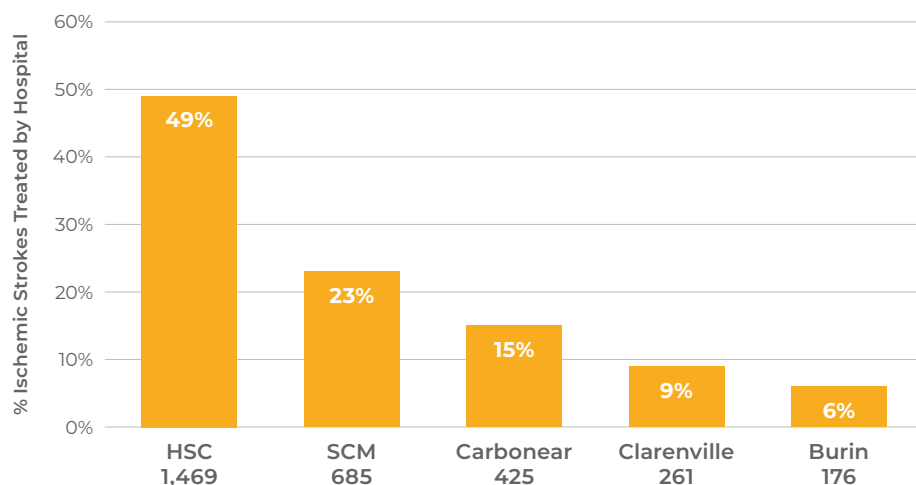
- Thrombolysis rates improved in the province from 2014–15 to 2018–19 but remained below target rates.
- Labrador-Grenfell Health (LGH) had substantial and sustained improvement in thrombolysis rates following visit from the implementation team and subsequent change in process of care.

Figure 2. Per Cent of Ischemic Strokes That Received tPA in Each RHA From 2014–2020

Table 2. The Number of Ischemic Strokes and the Number Who Received Thrombolysis in the Five Hospitals of EH and in Four Health Centres From 2014–15 to 2019–20

Hospital	Fiscal Year											
	2014–15		2015–16		2016–17		2017–18		2018–19		2019–20	
	N	n	N	n	N	n	N	n	N	n	N	n
HSC	210	14	233	17	229	22	234	22	277	39	286	46
SCM	100	12	115	6	127	13	113	9	119	9	111	10
Carbonear	41	8	63	5	76	3	73	4	103	9	69	6
Clarenville	41	0	50	9	45	8	35	3	42	1	48	2
Burin	38	2	39	4	32	5	26	2	21	0	20	1
Other	13	0	4	0	14	0	13	0	13	0	10	0

- It is not surprising that no patients received thrombolysis in the health centres, as they do not have a CT scanner to diagnose ischemic stroke. Stopping at these Emergency Rooms (ERs) was a barrier to receiving tPA.



- Although the Health Sciences Centre (HSC) treated nearly half of the strokes, a substantial number (N=1,547) were treated in the other four hospitals.

Figure 3. Percentage of Ischemic Strokes Treated by Hospital From 2014–15 to 2020–21

Table 3. Per Cent of Ischemic Strokes That Received tPA in the Five Hospitals of EH (all with a CT scanner)

Hospital	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21 Q1–Q2
Health Sciences Centre	6.7%	7.3%	9.6%	9.4%	14.0%	16.1%	19.1%
St. Clare’s Mercy Hospital	12.0%	5.2%	10.2%	8.0%	7.6%	9.0%	6.3%
Dr. G.B. Cross Memorial Hospital	0.0%	18.0%	17.8%	8.6%	2.4%	4.2%	0.0%
Carbonear General Hospital	19.6%	7.9%	3.9%	5.5%	8.7%	8.7%	5.6%
Burin Peninsula Health Centre	5.3%	10.3%	15.6%	7.7%	0.0%	5.0%	0.0%

- The HSC had a substantial improvement in thrombolysis rates following implementation efforts by the hospital.
- Thrombolysis rates at St. Clare’s Mercy Hospital (SCM) and at the three rural hospitals were low and did not improve over time.

Conclusions

1. Although thrombolysis rates have improved in the province since 2014–15, the overall rates are not good.
2. Bringing a patient with stroke symptoms to a health centre without a CT scanner is harmful because it delays access to tPA.
3. Beneficial improvements in thrombolysis rates were observed at the HSC and in LGH following engagement with content experts.
4. The majority of ischemic strokes are occurring in regions with low thrombolysis rates or in EH in hospitals with low thrombolysis rates. Improvement is urgently required.