

<b>Article details: 2018-0057</b>	
Title	Quantifying candidate volume for endovascular therapy for acute ischemic stroke at Health Sciences North: a one-year, retrospective chart review
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<b>Reviewer 1</b>	Sophia Gocan RN, MScN
Institution	The Ottawa Hospital, Champlain Regional Stroke Network, Ottawa, Ont.
General comments (author response in bold)	<p>The authors completed a retrospective chart review of all patients with acute ischemic stroke admitted to HSN over the course of 12 months, ending April 2017 to determine the volume of potential EVT candidates in the region. This study included patients who presented to HSN within 24 hours, who were seen by the stroke-on-call team, who were reviewed for thrombolysis eligibility and had undergone CT/CTA imaging. The results identify that approximately 4.21 percent of patients discharged with acute ischemic stroke were potentially eligible candidates for EVT. These estimates are applied to the region to calculate a projection for EVT candidates in the region annually. The discussion appropriately identifies limitations of the study methods and considerations which may impact procedural volumes over time. The study implications take into account trends noted in other regions internationally. The conclusions identify important implications for improving equitable access to EVT stroke services. This study provides the groundwork to quantify barriers to access and equity experienced by residents of Northern Ontario based on geographical obstacles and will provide a needed foundation for capacity planning and system design.</p> <p>Minor comments: Inclusion and exclusion criteria were a bit choppy to read and could be itemized more clearly. It was not clear if CTA was a requirement given 20 of the 71 patients did not have completed CTA imaging from arch to vertex.</p> <p><b>Thank you for the comment. The inclusion and exclusion criteria were reworded for clarity. Specifically, we added a sentence to account for inclusion based on age and sex (page 5, line 86). We also provided justification as to why patients that were not seen by stroke-on-call were excluded, citing the fact that they are guaranteed not to have the requisite data to determine candidacy (page 5, lines 89-90). However, beyond excluding patients not seen by stroke-on-call, we did not have another method for screening charts that would not have the proper imaging completed, and as such 20/71 patient charts reviewed did not have a CTA. Lack of a CTA was not the basis for exclusion itself.</b></p> <p>It should be specified that the EVT number needed to treat is based on a reduction in the disability level by one point on the mRS.</p> <p><b>Thank you for the comment. We have specified this outcome measure in both the introduction and discussion sections where the ESCAPE trial is mentioned (Page 3, line 47-48; page 15, line 247).</b></p> <p>References should be added for the ASPECTS score and NIHSS.</p> <p><b>Thank you for the comment. References have been added for both the ASPECTS score (page 7, line 125) and NIHSS (page 6, line 114).</b></p>

<b>Reviewer 2</b>	Noreen Kamal PhD, MASc, PEng
Institution	University of Calgary, Clinical Neurosciences, Calgary, Alta.
General comments (author response in bold)	<p>This paper presents data from a single centre in Northern Ontario for Ischemic stroke patients that would be eligible for EVT in an effort to determine if they would have sufficient volume to become an EVT-capable hospital.</p> <p>This is a good endeavour to undertake; however, I am not sure of the "research" contribution of this exercise. I think that a report to key decision makers containing this data would be the ideal output of this report. The authors should consider what the research questions are for this undertaking and how the methodology or results can be generalize for other sites.</p> <p>On top of a lack of contribution, I have other issues with the paper in its current form: I am very concerned about the number of total patients that were included in the study. It seems that there were 221 ischemic stroke patients at this centre in the study period, but only 71 were included. I want to see the exact numbers of patients that were excluded for each reason. How many of the 150 excluded cases were because they arrived after 24 hours and how many because that stroke-on-call team did not see the patient. This number is very concerning and I believe that there are likely a lot of cases in the 150 excluded patients that are eligible for EVT.</p> <p><b>Thank you for the comment. We have clarified in the methods section the reasons for excluding each of the 143 charts (page 6, line 97-98) The authors agree that there are likely many missed cases in those excluded patients. In the methods section we added clarification as to why only patients seen by stroke-on-call were included, citing that these are the patients that receive a CTA arch-to-vertex on presentation (page 5, lines 89-90). Patients who are not seen by stroke-on-call do not receive a CTA on presentation, and hence it would not be possible to determine their candidacy. This is a major limitation of using a retrospective methodology, and we address these short-comings (retrospective methodology – page 16, lines 280-282; inclusion/exclusion criteria – page 17, lines 286-295) in the limitations section. To this end, this paper demonstrates that despite many short-comings in terms of underestimation, we were still able to meet HQO’s minimum requirement of 20 annual procedures (page 14, lines 230-232).</b></p> <p>In the methods, the sentence that reads "Patients that either bypassed or presented to an ED in HSN's catchment area and were subsequently transferred to HSN were also included." is extremely confusing and makes no sense. Transferred from where? Bypassed to HSN or another hospital? This is important to the inclusion criteria, but it needs to be made much clearer.</p> <p><b>We added some clarification to this set of inclusion criteria, including that bypass protocol is from an emergency department in HSN’s catchment area to HSN (page 5, lines 91-94). Thank you for the suggestion, please let us know if this is still unclear.</b></p> <p>The authors seem confused by the definition of "Presentation". In table 1, they show the ESCAPE criteria that includes time from presentation to puncture to be within 6 hours. Presentation in this case means "Onset time of stroke or last seen normal". Later on in Table 2, they show time from "presentation to tPA" and "onset to tPA" as two separate measures, which clearly shows that they have no clear understanding of what "presentation" means. I think they are using it as hospital arrival time or when the stroke team assessed the patients, but it is not clear. The authors should note that the current</p>

guideline for Door-to-Needle time for tPA is 30 minutes, and this data shows that the "presentation to tPA" time is 68 minutes, which is very long. All time measures should be presented as medians (IQR) rather than means, as they are not normally distributed.

**Thank you for the suggestions. The word "presentation" in table 1 was used erroneously, and we apologize for any confusion this may have caused. We have replaced "presentation" with "stroke onset" to accurately reflect the ESCAPE criteria (page 7, line 121). Furthermore, we clarified that our use of the word "presentation" reflects hospital arrival throughout the paper (page 6, line 111). All time measures are now expressed as medians (IQR) in accordance with your suggestion (Table 3 – page 9-10, line 171).**

Further to my concerns outlined in #1 above, I am also very concerns about the numbers that were then shown as qualifying for EVT. Much of the exclusion were based on lack of data such a imaging and NIHSS rather than actual data. This in my opinion makes that entire exercise meaningless. This is not a true representation of the number of patients that would be eligible for EVT.

**Thank you for the comment. We agree that lack of data was a major limitation of this paper. We have outlined the impact of a retrospective methodology and lack of relevant data in the limitations section of the discussion (page 16, lines 280-281). As above, we have further reinforced in the conclusions section of the discussion that despite the many factors that make our candidate rate an underestimate, that we were still able to surpass the theoretical rate required to meet HQO's minimum procedural volume (page 14, lines 226-233). As such, we believe that we were still able to adequately answer and provide support for our research question.**

I am also concerned that they removed patients that were not functionally independent prior to their stroke. The authors should understand why this was an ESCAPE (or RCT) criteria and why this does not relate to actual practice. The reason for excluding these patients from RCTs is to have a clean and clear understanding of the mRS outcomes, so that everyone is a 0 prior to their stroke. This does not mean that a patients that was a mRS of 1 should be excluded from EVT. Our centre (the lead site for ESCAPE) will treat these patients to ensure that they do not have further disability due to their stroke.

**Thank you for the comment. As mRS/Barthel index scores were not available in our data, we defined functional independence as independence in activities of daily living (ADLs – page 6-7 lines 114-118). This would encompass mRS scores ranging from 0-2. In the limitations section of the paper, we address the possible disparity between using the ESCAPE trial criteria for choosing candidates vs. actual clinical practice, as you have outlined may contribute to underestimation (pages 17, lines 300-301). The rationale for using the ESCAPE trial criteria was to have a standardized set of criteria against which we could compare our data, rather than introducing bias in the form of clinical judgement. We have added a sentence to address the fact that real-world practice would include offering EVT to patients that are not functionally independent pre-stroke (page 17, line 304).**