

**Stroke Services BC
Position Statement**

Date of Decision: April 2018

Anticipated Date of Review: Fall 2019

Topic: Provincial Stroke Imaging Protocol

Summary Recommendation: All patients with 'hot stroke' should receive non-contrast CT, CT angiogram, and multiphase CT angiogram as first line imaging.

Context for Change:

Hyperacute stroke therapy has always been reliant on imaging in order to support clinical decision making. In the days before EVT (endovascular therapy), a non-contrast CT [NCCT] of the head was all that was required in order to assess eligibility for thrombolytic therapy. EVT requires additional imaging in order to visualize the clot and assess collateral blood flow (CT angiogram [CTA] and multiphase CT angiogram [mCTA] respectively). When the full imaging package (NCCT, CTA, mCTA) is not done as first line imaging, significant delays to treatment can be created. Given the rate of neuronal death in a typical large-vessel stroke – 1.9 million neurons/minute – any and all efforts to reduce time to treatment are important. Accordingly, SSBC has worked with the Provincial Medical Imaging Advisory Council and SSBC hyperacute committees and stakeholders over a year to create and approve a Provincial Stroke Imaging Protocol.

Description:

The Provincial Stroke Imaging Protocol states that all patients with 'hot stroke' should receive NCCT, CTA, mCTA as first line imaging, with a door to scan time of under 10 minutes. See associated position statement for the definition of 'hot stroke'. The protocol acknowledges that the literature on the ideal window for hyperacute stroke therapies, particularly endovascular therapy, is rapidly evolving and this definition of a hot stroke may continue to evolve. As a general principle, people with new symptoms of acute stroke should be immediately and thoroughly imaged in order to support treatment decision making. Recent evidence suggests that some people may benefit from EVT up to 24 hours after the onset of their stroke.

Evidence:

The Canadian Stroke Best Practice Recommendations (update 2015) recommend endovascular therapy (EVT) up to 6 hours from symptom onset or last seen normal. Since these recommendations were published, additional research has been released, indicating that a selected group of patients can still benefit from EVT up to 24 hours from symptom onset/last seen normal^{1,2}. The next iteration of

¹ Nogueira et al (2018). Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. *The New England Journal of Medicine*. 378: 11-21.

² Albers et al (2018). Thrombectomy for stroke at 6 to 16 hours with selection by perfusion imaging. *The New England Journal of Medicine*. 378: 708-718.

Canadian Stroke Best Practice Recommendations (due out later in 2018) is anticipated to increase the time window for EVT to 24 hours.

The Canadian Stroke Best Practice Recommendations (update 2015) also recommend all patients with suspected acute stroke receive immediate NCCT and CTA (evidence level A) and that assessment of collateral flow (mCTA) should be completed and should not unduly delay access to care (evidence level B) (www.strokebestpractices.ca). It should be noted that vascular imaging is not only useful in determining eligibility for EVT, but also plays a role in the management of TIA/minor stroke as well as hemorrhagic stroke.

Rationale/Consensus:

The axiom “Time is Brain” and the knowledge that the faster we can treat someone the more of the person we can save is the rationale behind this imaging protocol. Real-life experiences show that doing a NCCT first, returning to the emergency department and then subsequently deciding to do CTA/mCTA results in delays between 15 minutes and 2 hours or more. These delays have significant impact on the individual experiencing the stroke. While this increased imaging will pose some additional burden to the system, particularly in radiology, the benefit of reducing time to treatment and reducing the potential brain damage an individual suffers substantially outweighs that risk.

Approved by:

- Medical Imaging Advisory Council
- Hyperacute Focus Table
- Provincial Stroke Steering Committee

Considerations:

We understand that all CT scanners in BC have the technical ability to perform CTA and mCTA but that not all sites necessarily have the human resources required to offer those services at all or consistently. These sites will need to critically evaluate their role in hyperacute stroke care, the human resources they can reasonably attain in order to support stroke care, their on-call processes to reduce delay to imaging if technologists are not available on-site 24/7, and potentially the need for EHS to bypass their site if they cannot deliver the standard imaging care required for hyperacute stroke treatment. While this protocol will stress the health system to some degree, the benefit to patients is irrefutable.

Contacts:

Please see attachment for health system contacts.

Attachments (click to open):

BC CT_CTA Stroke Imaging Protocol