2020 PROVINCIAL GUIDELINE

Pre-hospital Triage and Transport Guidelines for Adult Stroke in British Columbia

BCEHS | BC Emergency Health Services
Provincial Health Services Authority

STROKE SERVICES BC
Provincial Health Services Authority

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Foreword

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Developed in collaboration between British Columbia Emergency Health Services (BCEHS), Stroke Services BC (SSBC) and the regional health authorities, this guideline describes a decision making framework for pre-hospital triage and transport of hyperacute stroke patients in British Columbia. This document is the result of assembling recommendations based on best available evidence and the expertise of our clinical and operational stroke leaders throughout the province. In particular, we acknowledge the challenges faced by rural, remote and indigenous communities and have worked collaboratively with our partners to address their specific concerns. The goal and impact of this project is to support improved and equitable care by streamlining access to early diagnostics, specialist consultation and advanced hyperacute stroke therapies to all British Columbians.

This guideline is endorsed by BCEHS, SSBC and regional stroke programs representing their respective health authorities. Regionalization and operationalization of the guideline principles are completed by the regional stroke programs and health authorities to meet the needs of the populations they directly serve.

We recognize that the implementation of this guideline will take place across the traditional territories of the First Nations peoples of BC.

Introduction

British Columbia has a tiered stroke system in which all health care facilities play a designated role in the care of the stroke patient. Stroke and TIAs are time-sensitive medical emergencies where organized and timely pre-hospital care and transport have been shown to improve outcomes. A comprehensive and consistent provincial stroke triage and transport guideline will support improved and equitable care for all British Columbians, acknowledging the challenges of our expansive geography and distribution of population.

Appropriate pre-hospital destination decision making for hyperacute stroke patients can significantly improve time to brain-saving treatments and have the potential to reduce disability from stroke. Ideally, patients with hyperacute stroke symptoms should be initially transported to a hospital that has the capacity to provide diagnostic CT imaging and clinical expertise to administer thrombolytic therapy – referred to in this document as *thrombolysis providing stroke centres*. Stroke patients with large vessel occlusions should also be considered for early access to endovascular therapy (EVT), an intervention only available at four hospitals in BC – referred to in this document as *EVT providing stroke centres*. In combination, both of these types of hospitals are referred to as *stroke centres*.

It is known that only 70% of all stroke and TIA admissions to hospital arrive by ambulance. Patients with symptoms of hyperacute stroke who self-present to a non-thrombolysis or non-EVT providing stroke centre require rapid interfacility transfer to an appropriate stroke centre for urgent evaluation and management.

This document defines a provincial pre-hospital stroke triage and transport guideline to be utilized by BCEHS paramedics and dispatchers. It is intended that the Regional Stroke Programs will adapt this guideline to particular geographic and access challenges, resource availability, and other regionally specific needs. Health Authorities will be responsible for determining destination centres, regional referral patterns, and no-refusal policies for the reception of hyperacute stroke patients.

Given the evolving nature of clinical stroke care and inherent changes within individual health authorities, this document will be reviewed and updated regularly.

Scope

Developed as a collaboration between BCEHS, SSBC and Regional Stroke Programs representing their respective health authorities, this document describes the decision making framework for pre-hospital triage and transport of adult[1] hyperacute stroke patients in British Columbia.

The main objective of the pre-hospital stroke system is to improve access to hyperacute stroke care. This is accomplished through accurate recognition of the hyperacute stroke patient, expedited transport to designated stroke facilities for initial diagnostic imaging and thrombolysis, and streamlined processes for interfacility and air transport to regional EVT and neurosurgical services in eligible candidates.[2,3,4]

This document will also discuss best-practices for pre-hospital hyperacute stroke care, including pre-notification to stroke centres, the importance of continual stroke education for pre-hospital providers, and processes for continuous quality improvement.[5]

1 For the purposes of this guideline, adult is defined as age ≥ 18 years. If a paramedic suspects a stroke in a patient under the age of 18, they should call CliniCall/EPOS for further guidance.

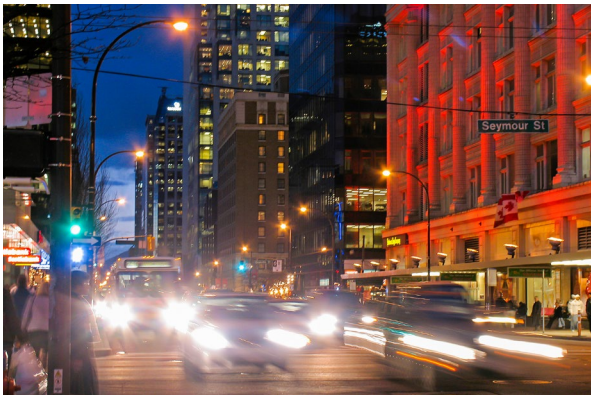
2 Jauch EC, Saver JL, Adams HP, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2013;44(3):870-947. doi:10.1161/STR.0b013e318284056a.

3 Stiell IG, Clement CM, Campbell K, et al. Impact of Expanding the Prehospital Stroke Bypass Time Window in a Large Geographic Region. Stroke. 2017; 48(3):624-630. doi:10.1161/STROKEAHA.116.014868.

4 Pride GL, Fraser JF, Gupta R, et al. Prehospital care delivery and triage of stroke with emergent large vessel occlusion (ELVO): report of the Standards and Guidelines Committee of the Society of Neurointerventional Surgery. J Neurointerv Surg. 2017; 9(8):802-812. Doi: 10.1136/neurintsurg-2016-012699.

5 Centers for Disease Control and Prevention. Division for Heart Disease and Stroke Prevention. What is the Evidence for Existing State Laws to Enhance Pre-hospital Stroke Care? Centers for Disease Control and Prevention. 2017:1-29.

Geographical Considerations in British Columbia



British Columbia has a vast and varied geography which must be reflected in regional clinical destination pathways. The following outline some key considerations for stroke transport in urban, rural, and remote communities that should be incorporated into regional planning.

Urban Communities

Clear stroke destination pathways are essential in urban areas where multiple hospitals are located in close proximity. Patients should be transported to the most appropriate stroke centre rather than the closest based on regional destination pathways, as some urban areas have both thrombolysis and EVT providing stroke centres in close proximity.

Rural and Remote Communities

Nearly 27% of BC residents live in a rural or remote community.[6] In addition, BC has numerous inhabited islands which also pose significant challenges for initial transport to a stroke centre. When developing clinical destination pathways to provide equitable access to stroke care for all British Columbians, Regional Stroke Programs and health authorities will also need to consider ground transport times, variable weather, access to air transport and the operational implications of emergency response in communities with single ambulance coverage when they are tasked to longer distance transports for stroke patients. Early consultation with BCEHS Patient Transfer Services (PTS) is critical to clinical and logistical planning. The BCEHS EMS Physician Online Support (EPOS) and Critical Care Paramedic Advisor (CCPA) play a vital role in ensuring stroke patients are transported to the most appropriate stroke centre as quickly as possible, utilizing both ground and/or air ambulance as appropriate.

6 Rural Coordination Centre of BC. Accessed 7/20/2020 at https://rccbc.ca/rural-communities/

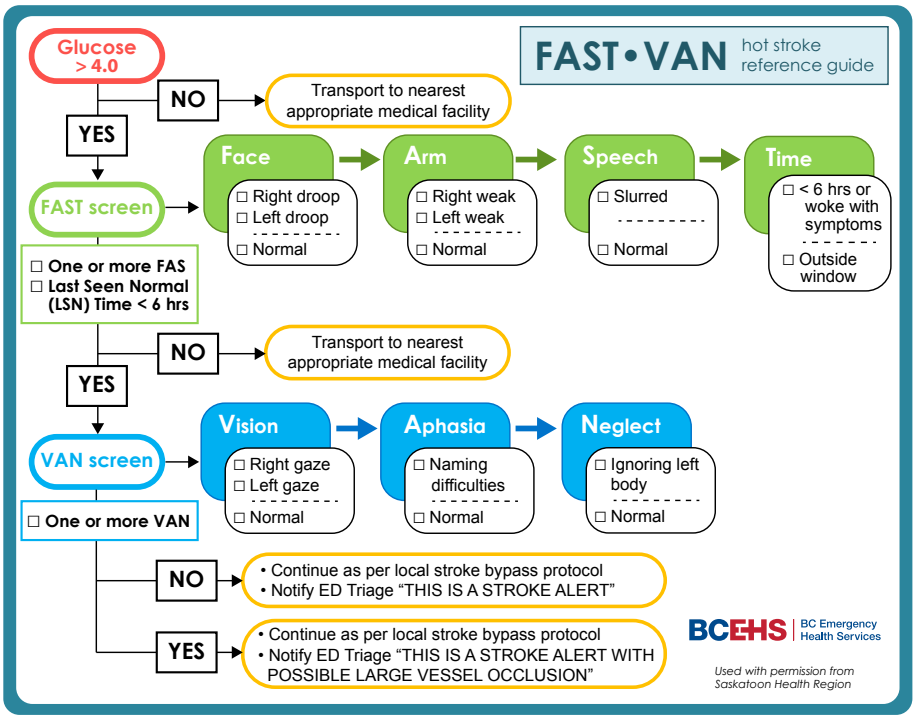
Pre-hospital Stroke Triage and Transport Principles

Accurate recognition, timely management and transport utilizing regional stroke clinical destination pathways and pre-hospital notification are the guiding principles to pre-hospital stroke care.

1. Accurate Recognition

All suspected hyperacute stroke patients require an initial rapid assessment that includes vital signs, level of consciousness and glucose measurement. If a paramedic is unable to successfully manage a compromised airway in the suspected hyperacute stroke patient, transport should be directed to the nearest Emergency Department. Patients who are hemodynamically unstable should also be transported to the nearest Emergency Department. CliniCall or EPOS physician consultation can be obtained for further advice in these situations as necessary.

FAST-VAN Stroke Assessment



The FAST-VAN assessment has been implemented by BCEHS as the provincial pre-hospital stroke triage tool to identify hyperacute stroke.

The FAST assessment is performed to screen for hyperacute stroke. All patients with Face, Arm or Speech symptoms AND either onset of symptoms within 6 hours or if the symptoms are present upon waking are suspected to be having a hyperacute stroke. Paramedics should work with the patient, family members and other witnesses to determine an onset time as accurately as possible.

If the FAST assessment is positive, paramedics will proceed to perform the VAN assessment. This secondary assessment provides information about the likelihood of the stroke being classified as a large-vessel occlusion and may influence treatment and transport decisions.

Patients presenting with fluctuating symptoms of stroke should be treated as a hyperacute stroke and transported to the most appropriate stroke centre.

If a patient does not screen positive on the FAST assessment, then they should be transported to the nearest appropriate hospital for further evaluation. If a patient does not screen positive on the FAST assessment, but there is still high suspicion of hyperacute stroke, CliniCall or EPOS physician consultation should be obtained for further guidance.

REMEMBER: TIME IS BRAIN

+ VISION =	**Patient looking preferentially to one side** ! Usually away from the hemiparesis
+ APHASIA =	**Patient looks at simple objects but can't name them** (*e.g. pen, watch*) ! Usually goes with **right** hemiparesis
+ NEGLECT =	**Patient ignores left side when both sides are touched simultaneously** ! Usually goes with **left** hemiparesis

NEGLECT STEP TESTING:

- Provide Instructions Ask patient to close their eyes and say aloud "left, right, or both" when arms are touched.
- Perform Neglect Test Touch right, then left, then both arms together—asking for a response after each stimulus.

Neglect is positive when patient is only able to identify that the right side was touched, when both sides were touched at the same time

DON'T FORGET:

1. Perform and document a glucose check to rule out stroke-mimics
2. Provide oxygen for suspected stroke patient when O_2 sats < 94%
3. Transport patient to appropriate hospital with your best attempt at an on scene time of < 20 minutes
4. Pre-hospital IV placed if possible (without delay of transport)
   ! *Preferably above hand, using a 20 gauge IV (or larger)*
5. Pre-notify the ED with stroke alert as per algorithm
   ! *Pt Name ● PHN ● DOB ● Sex ● LSN 00:00 ● FAST VAN Findings ● ETA* (Remember SBAR)
6. Document the onset of symptoms time in the box provided
7. Ensure you note the correct impression code on the PCR/Siren
8. Document pertinent neurological signs and symptoms on the PCR/Siren
9. If you are a FRONTIER-trained paramedic, do not deviate from the FRONTIER protocol

2. Timely Management and Transport

Transport Must Not Be Delayed

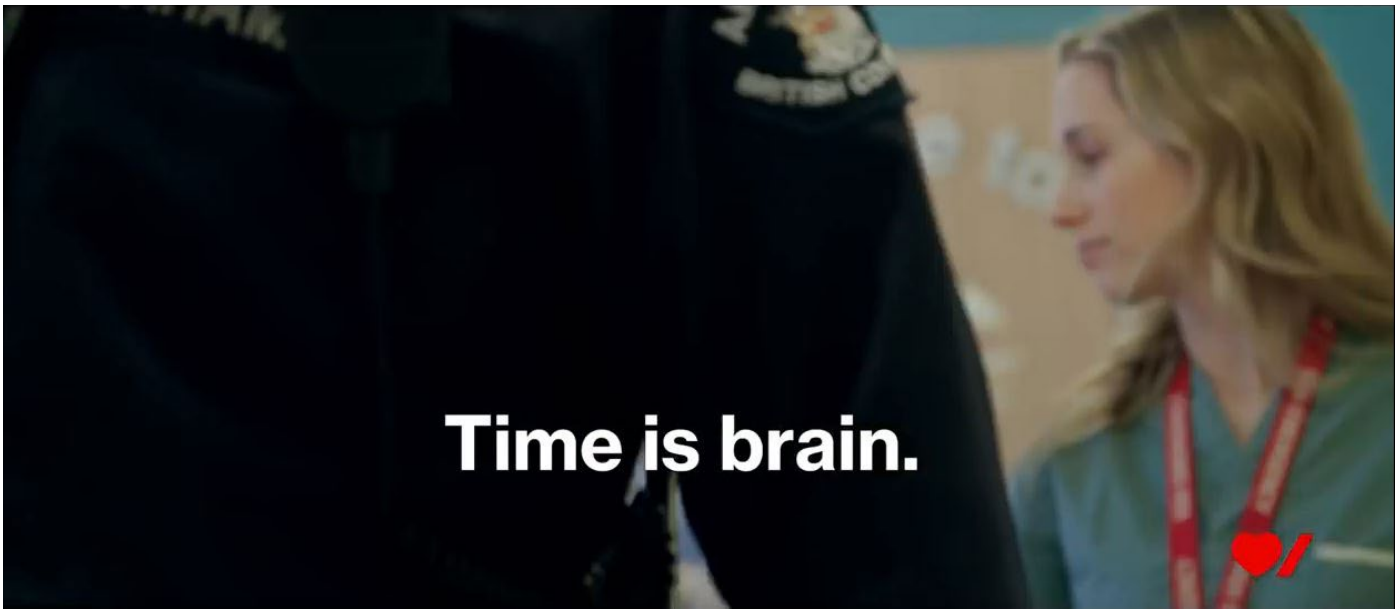
Rapid identification and transport of suspected hyperacute stroke patients to the closest and most appropriate stroke centre is critical for avoiding long term disability or death. Scene time, which includes assessment and preparation for transport, should be limited to 20 minutes. Most patients with suspected hyperacute stroke do not require advanced pre-hospital management and interventions and can be rapidly transported by Primary Care Paramedics within their scope of practice.

While the treatment window for thrombolysis remains 4.5 hours, the potential window for endovascular therapy extends to 24 hours for selected cases. The current hyperacute (hot) stroke definition (All patients with Face, Arm or Speech symptoms AND either onset of symptoms within 6 hours or if the symptoms are present upon waking are suspected to be having a hyperacute stroke) is designed to ensure that as many people as possible are considered for life and disability saving treatment. Note that some regions may define a longer time from symptom onset to be considered as a hyperacute stroke for the purposes of increasing access to EVT.

Essential Pre-Hospital Stroke Management and Interventions

- Basic Life Support (Airway, Breathing, Circulation) interventions as appropriate.
- Complete a FAST-VAN assessment for hyperacute stroke.
- Obtain a blood glucose level to rule out a stroke mimic.
- Establish a peripheral IV (at least 20 gauge) only if the intervention will not delay transport.
- Obtain a contact number for the most reliable witness or family contact.

Paramedics should refer to their regional stroke destination pathways specific to the areas they are responding to. If a corresponding destination pathway for a specific region does not exist, suspected hyperacute stroke patients should be transported to the nearest stroke centre. If transport to the nearest stroke centre results in a significant transport distance or time, CliniCall and EPOS consultation should be obtained for further guidance.



3. Effective Communication and Pre-hospital Notification

Communications with the Emergency Department

Pre-hospital notification is critical, allowing a stroke centre to prepare in advance of the patient's arrival. Pre-hospital notification serves to activate the stroke team (i.e. Stroke neurologist, radiologist and CT technologist, nursing, laboratory staff) so that they can pre-register the patient and are ready to intervene as soon as the patient arrives.

Pre-hospital notification should include the following information as a minimum standard:

- Name, date of birth, PHN
- Symptom onset time if witnessed OR last seen well time if unwitnessed, including if symptoms were present on waking
- FAST-VAN assessment results and other relevant stroke presenting signs and symptoms
- Vital signs, including glucose

Pre-notification should occur as soon as practical when the paramedic crew is en-route to stroke centre. In situations where transport times are prolonged, a second notification when the crew is 15 minutes away from the stroke centre is recommended.

Urgent Transfer for Advanced Stroke Interventions

Hyperacute stroke patients may be transported to a stroke centre according to the regional stroke destination pathway, but require further stroke interventions only available at another stroke centre, generally an EVT-providing stroke centre. The most common scenario in which this occurs is when a patient is initially transported to a thrombolysis-providing stroke centre but is determined to be a candidate for EVT.

Based on regional stroke pathways, paramedics may be asked to stay with a stroke patient at a non-EVT providing site for up to 30 minutes until a decision is made about whether they require urgent interfacility transfer for further interventions. BCEHS PTS should be involved at the earliest possible time to facilitate transport and logistics planning. The national door-in/door-out time target is 45 minutes, and this process aims to reduce time to definitive intervention. The expectation is that clinicians at a stroke centre will make a decision about interfacility transfer within the first 30 minutes of arrival.

Special Considerations

Contingency planning in the event that a CT scanner is inoperable:

- Upon pre-notification, the receiving hospital is responsible for confirming if the CT scanner is currently operational.
- In the event that the CT scanner is inoperable, BCEHS will transport the patient to the next closest stroke centre as directed by regional stroke clinical destination pathways.

No-refusal policy

- All stroke centres must accept stroke patients who arrive by EHS.

Rapid Physician Assessment for Appropriateness of Long Transport to Stroke Centre

- In rural and remote communities, transport time and distances to the nearest stroke centre can be long. In certain cases, CliniCall or an EPOS physician may determine that a suspected hyperacute stroke patient would benefit from a rapid physician assessment at the nearest facility to assess for the appropriateness of a long transport to a stroke centre. In this scenario, the patient should remain in the ambulance for the physician assessment to reduce any potential delays if it is determined that transport to the stroke centre should proceed.

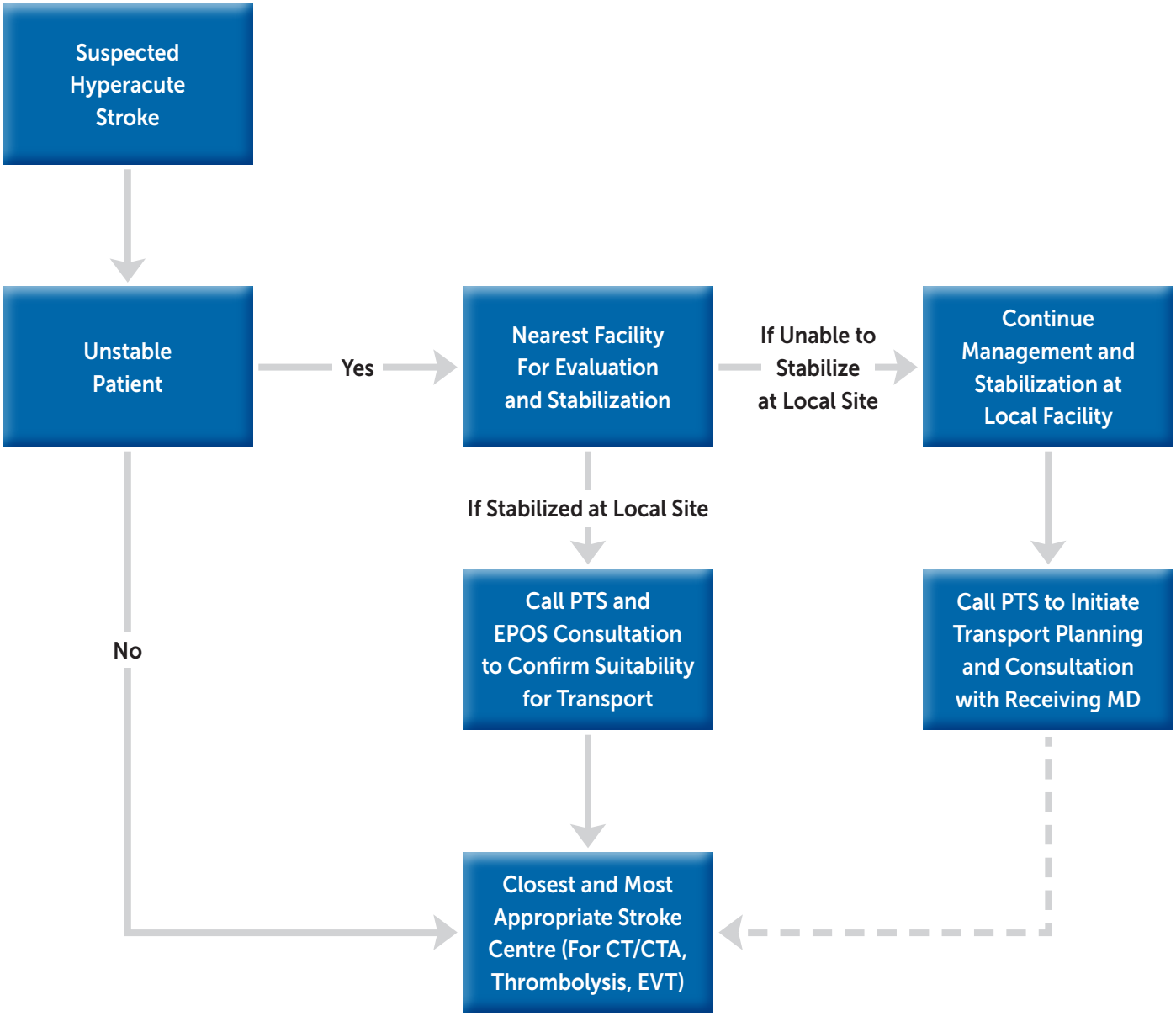
Crossing Health Authority Boundaries

- Transport and destination decision making should be made based on shortest time to most appropriate stroke centre and not constrained by geographical health authority borders.

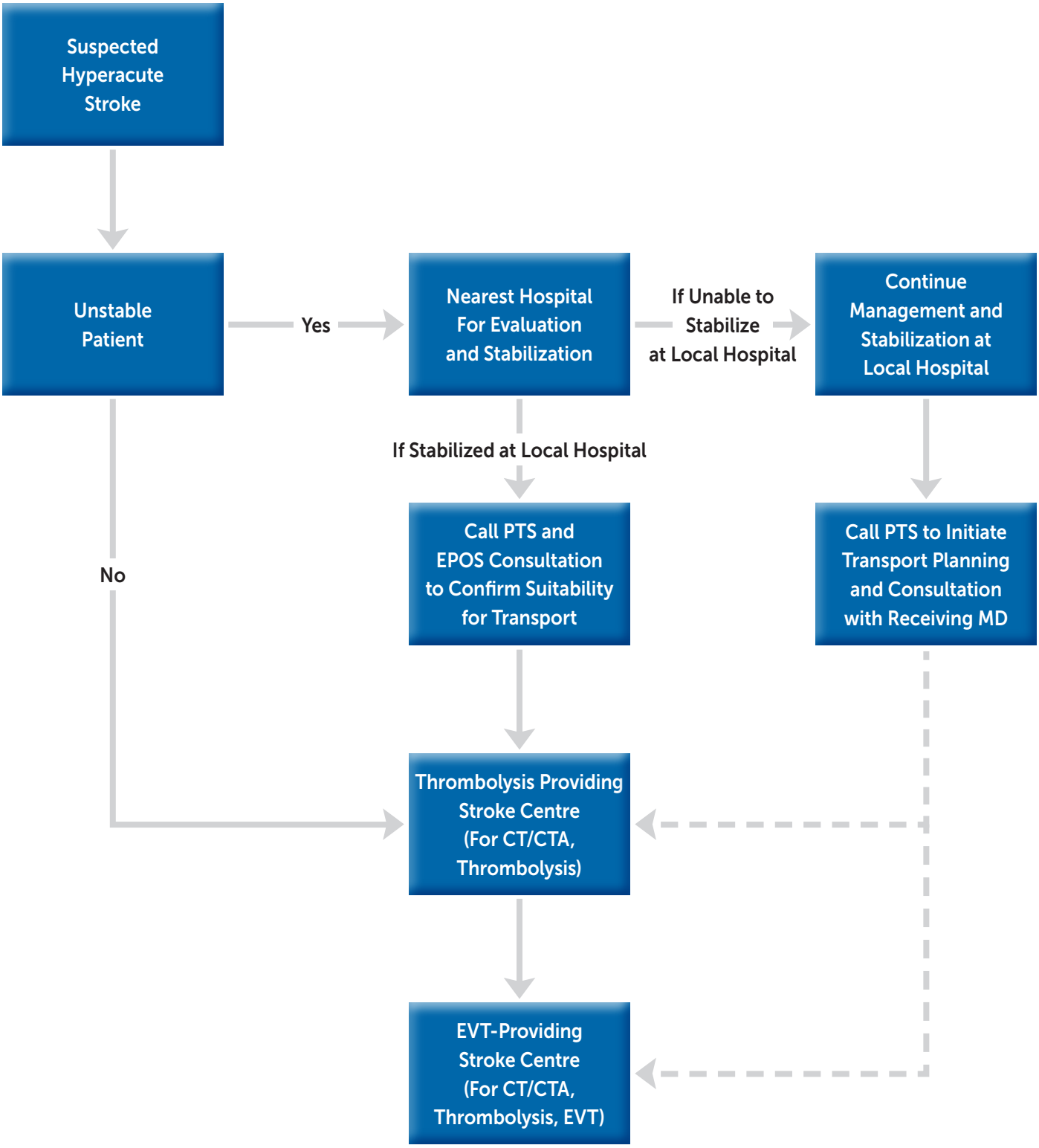
Pre-hospital Stroke Clinical Destination Pathway Process Maps for Urban, Rural and Remote Settings

The following process maps provide an idealized pathway and decision making process for pre-hospital destination planning.

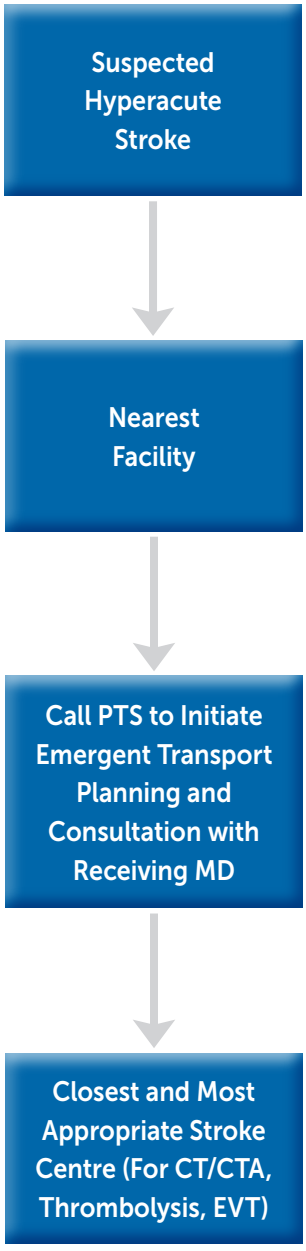
Urban Setting With Proximity to EVT-Providing Stroke Centre



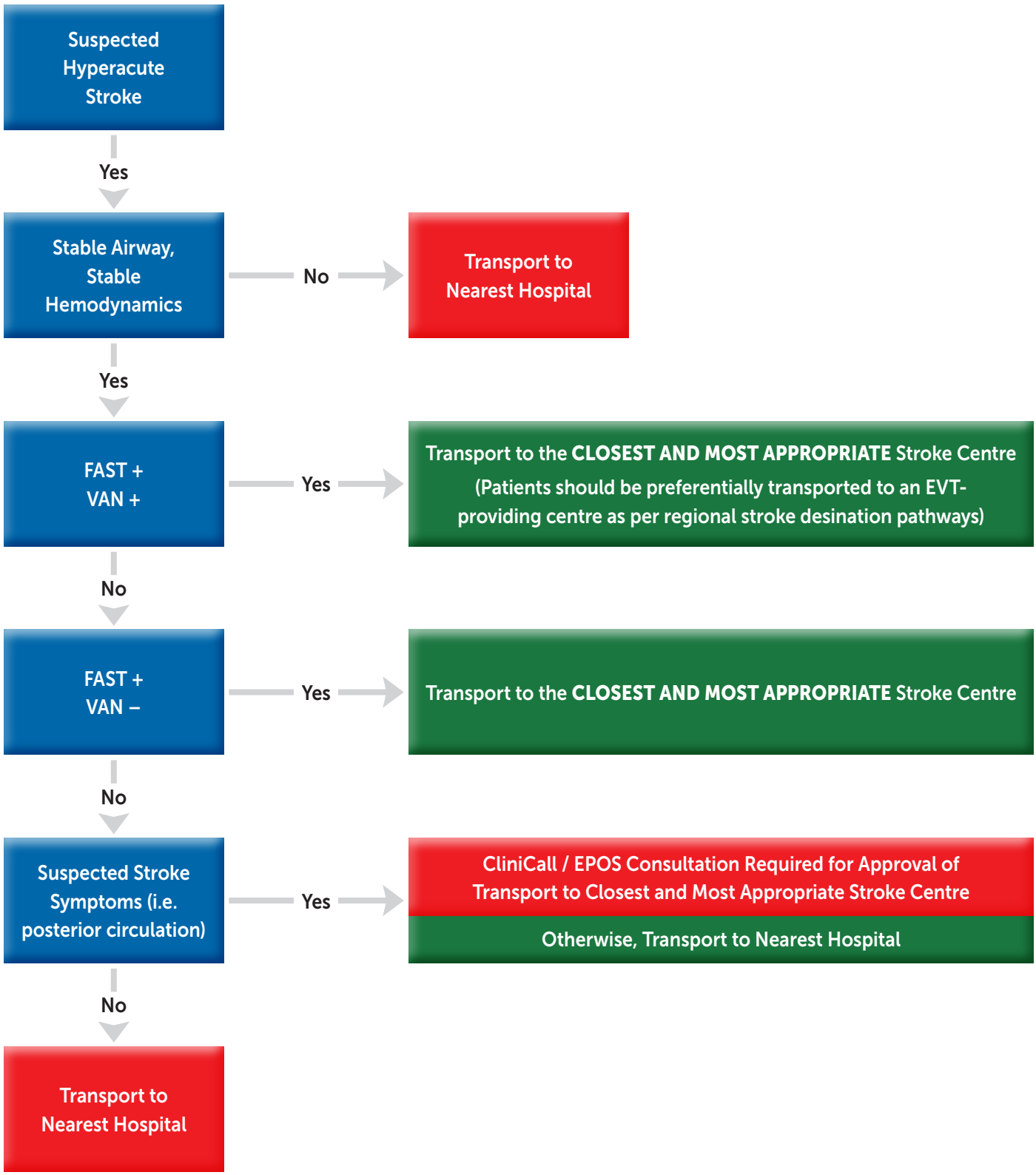
Urban and Rural Settings With Proximity to Thrombolysis-Providing Stroke Centre but not to EVT-Providing Stroke Centre



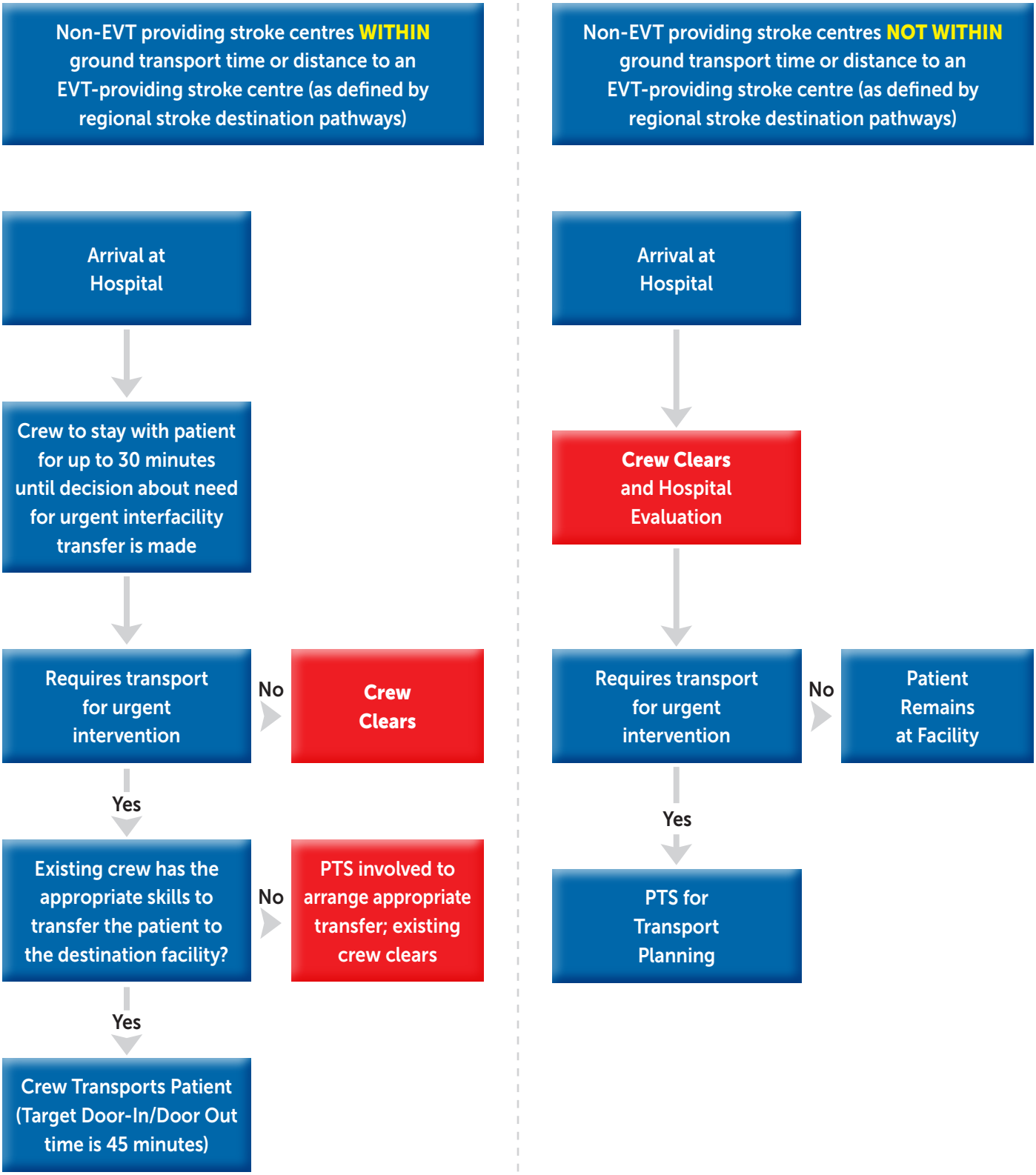
Rural and Remote Settings With No Proximity to Stroke Centre



Provincial Pre-hospital Stroke Triage — Community to Primary Destination



Provincial Stroke Transport — Emergent Transfer for EVT Guideline



Air Ambulance Utilization in Hyperacute Stroke Care

Given the large distances and hostile geography of British Columbia, air transport may serve an important role in improving access to hyperacute stroke care. Rotor-wing transport has potential to decrease transport times and increase access to isolated communities. Rotor-wing and fixed-wing transport can be utilized to expedite timely transport to advanced hyperacute stroke care, such as intra-arterial thrombolysis, EVT or neurosurgery.

Conclusion

The Pre-hospital Stroke Triage and Transport Guidelines are based on expert medical opinion guided by established existing evidence. The goal is to improve the outcomes of hyperacute stroke patients by providing paramedics with the necessary criteria to apply when assessing stroke patients in the pre-hospital environment and determining the most appropriate destination to access timely care.

For any questions, comments or change requests, please email Stroke Services BC at Katie.white@phsa.ca or BC Emergency Health Services at Wilson.Wan@bcehs.ca