

# Stroke: Hyper Acute and Acute Stroke Care

## Site Applicability

All VCH and PHC Acute Care sites

## Practice Level

Basic skills for the following professions (within their respective scope of practice):

- RN, LPN, RPN, NP
- Dietitian (RD)
- Occupational Therapist (OT)
- Physiotherapist (PT)
- Respiratory Therapist (RT)
- Social Worker (SW)
- Speech-Language Pathologist (S-LP)
- Pharmacist

## Policy Statement

### Clinicians must:

- Assess patients who exhibit symptoms using F.A.S.T. (face, arm, speech, time) criteria to identify onset of Transient Ischemic Attacks (TIAs) or Strokes.
- Ensure all patients with symptom onset of less than 6 hours or who wake up with symptoms are treated as a hot stroke (See [Appendix E](#) for provincial position statement and definition) and the Most Responsible Physician (MRP) is notified immediately.
- Ensure all patients following a stroke or TIA are assessed, triaged and managed by providing consistent, best practice care to patients following a stroke (See [Appendix B](#)). This will ensure patients receive the right care in the right place at the right time which will facilitate positive outcomes such as timely treatment, reduced complications, reduced length of stay (LOS), optimized rehabilitation therapy and appropriate discharge planning.

## Need to Know

### Brain Anatomy and Circulation:

The enhanced knowledge about brain function helps clinicians understand the presentation of their patient following a stroke and in turn assists the practitioner in how to appropriately care for the patient post stroke.

The following resources provide an overview of the basic anatomy and functioning of the brain:

- <http://www.heartandstroke.ca/stroke/what-is-stroke/stroke-and-the-brain>
- <http://brainstreams.ca/learn/healthy-brain>

See [Appendix A](#) for diagram of the different regions of the brain and their function.

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### What is a Stroke?

It is an interruption of blood flow to the brain which results in damaged brain tissue. The effects of a stroke are related to where the injury in the brain occurred and how much damage resulted. Stroke is the leading cause of adult disability and the third leading cause of death in Canada.

The following resource provides an overview of the different types of stroke:

- <http://www.heartandstroke.ca/stroke/what-is-stroke>

## Guideline

### Hyperacute Stroke Care:

Involves all direct care, investigations, interventions, service delivery and interactions from first contact with the healthcare system after the onset of an acute stroke or transient ischemic attack – usually through contacting emergency medical services, or presenting at a healthcare facility – through to discharge from an emergency department to either another healthcare facility (usually with a higher or lower level of stroke care available), to an acute inpatient care unit or return to the community.

**TIME IS BRAIN; 1.9 million brain cells die every minute after a stroke so quick action could prevent brain cells from dying. Any new symptom of a TIA or stroke is a medical emergency.**

Ischemic (strokes due to blockage of blood vessels) strokes are responsive to treatment by clot busting drugs (such as Tissue Plasminogen Activator or t-PA). The window of opportunity for this treatment is within 4.5 hours of the last KNOWN well time prior to new symptoms. The window for a hot stroke is intentionally extended to 6 hours to accommodate for the opportunity for endovascular therapy when warranted. Practitioners in all practice settings should recognize the signs and symptoms of stroke, and treat these symptoms as a medical emergency to have diagnostics completed and to expedite access to time-dependent stroke therapy.

### Hot Stroke Protocols:

In order to rapidly identify and assess individuals with a stroke regardless of where or how they present to our health system, stroke protocols and processes exist.

The specific processes and workflow for a hot stroke will vary according to individual facilities personnel and environment. See [Site Specific Practices](#) below.

Site Specific Practices	
VGH	<ul style="list-style-type: none"><li>• <a href="#">Inpatient Hot Stroke Algorithm</a></li><li>• <a href="#">Self-Presenting Hot Stroke Algorithm</a></li><li>• <a href="#">Brought in by EHS Hot Stroke Algorithm</a></li></ul>
LGH	<ul style="list-style-type: none"><li>• <a href="#">Inpatient Hot Stroke Algorithm</a></li><li>• <a href="#">Self-Presenting Hot Stroke Algorithm</a></li><li>• <a href="#">Brought in by EHS Hot Stroke Algorithm</a></li></ul>
PHC	<ul style="list-style-type: none"><li>• <a href="#">Hot Stroke Protocol ED and In-Patient (SPH and MSJ)</a></li></ul>

\*Protocols for Richmond, Sechelt and Powell River Hospitals in process of being revised and/or developed

The following videos demonstrate common signs and symptoms of someone experiencing a stroke:

- <http://www.heartandstroke.ca/stroke/signs-of-stroke>

### **Acute Stroke Care:**

Involves all direct care, investigations, interventions, service delivery and interactions occurring during the time a person who has had a stroke is admitted within an acute care hospital.

### **Care of Stroke Patient:**

Stroke care and recovery outcomes are unique to the patient and can vary depending on the area of the brain affected and the extent of the damage. All patients should receive an assessment for the care needs and potential for rehabilitation by health care professionals with expertise in stroke care. Patients admitted to hospital with an acute stroke or TIA should be treated on a stroke unit or transferred to the closest available stroke unit in the region. Their care should be managed by an interdisciplinary team with stroke care expertise including physicians, nursing, occupational therapy, physiotherapy, speech-language pathology, social work, clinical nutrition (dietitians) and pharmacy.

**Prevention and Intervention for Potential Problems:** See [Appendix B](#).

## Patient/Client/Resident and Family Education

Stroke education should be individualized and based on a patient's and family's current knowledge, stroke deficits, and identified learning needs.

The patient handbook "Your Stroke Journey" should be given and reviewed with all stroke patients and their families. The Heart and Stroke Foundation provide a number of health educational materials that can be ordered or downloaded for the purposes of stroke education:

- <http://www.heartandstroke.ca/what-we-do/publications>

See [Appendix C](#) for additional stroke educational websites.

Provide further education to patient/caregivers about the patient's risk factors and ways to modify them as appropriate. This should include:

- [High blood pressure](#)
- [Hypercholesterolemia](#)
- [Diabetes](#)
- [Atrial Fibrillation](#)
- [Healthy Eating](#)
- [Staying Active](#)
- [Healthy Weight](#)
- [Smoking](#)
- [Alcohol and drug use](#)
- [Stress Management](#)

### Education Sessions:

Stroke specific education sessions exist at VGH, LGH, GFS and HFF. For dates and times please consult with a nurse educator, stroke coordinator and/or clinician at one of these sites.

## Expected Patient/Client/Family Outcomes

- Stroke care will be standardized across VCH & PHC to ensure patients receive consistent and evidence based quality care.
- Length of stay will be optimized by maximizing functional recovery and preventing complications.
- Patients and families will receive and be provided with printed information on stroke prevention, care and recovery by interdisciplinary team members.
- Early discharge planning and proactive management of risk factors will guide daily care and expedite recovery.
- Patients will be discharged or transferred to an appropriate level of care.

## References

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- (2017). Healthy Brain. Retrieved from <http://www.brainstreams.ca/learn/healthy-brain/>

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<b>Owners:</b> <i>(optional)</i>	PHC/VCH	
	<b>Developer Leads:</b> <ul style="list-style-type: none"> <li>• Planning Lead, Regional Rehab program, Stroke Lead, Regional Medicine Program, VCH/PHC</li> <li>• CNE, VGH neurosciences, Vancouver Acute</li> </ul> <b>Development Team members:</b> <ul style="list-style-type: none"> <li>• RN, CNE, VGH Neurosciences, Vancouver Acute</li> <li>• RN, PCC, VGH Neurosciences, Vancouver Acute</li> <li>• Patient Services Manager, VGH Neurosciences, Vancouver Acute</li> <li>• OT, Stroke and TIA Coordinator, LGH Neurosciences, Coastal</li> <li>• RN, CNE, LGH Neurosciences, Coastal</li> <li>• Manager, LGH Neurosciences and Maternity, Coastal</li> <li>• CNE, RGH, Richmond</li> <li>• CNS, Medicine/Ambulatory Program SPH/MSJ, PHC</li> <li>• S-LP Practice Leader, Vancouver Acute</li> <li>• Physiotherapy Practice Coordinator, GFS and VGH Neuro and Spine Units, Vancouver Acute</li> <li>• OT Practice Coordinator, Vancouver Acute</li> <li>• Regional Clinical Resource Therapist, Physiotherapy, VCH</li> <li>• Regional Clinical Resource Therapist, Occupational Therapy, VCH</li> <li>• Regional Planning Lead, Medicine and Critical care Programs, VCH</li> </ul>	

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## **Local Stroke Protocols endorsed by:**

### **(April 2019) VGH protocols**

Operations Director, Neurosciences, VGH  
Manager, Neurosciences, VGH  
Operations Director, Hospitalists Units, VGH  
Manager, Hospitalists Unit, VGH  
Medical lead, Stroke Neurology, VGH  
Radiology, Emergency, VGH  
Neuroradiology, VGH  
Manager, Emergency, VGH  
Medical Lead Physician, Emergency, VGH  
Director, Patient Transfer Network, BCEHS

### **(April 2019) LGH protocols**

Operations Director Acute services Coastal  
Program Manager, Acute and Chronic Conditions, LGH  
Medical Lead, Neurology, LGH  
Manager, Emergency, LGH  
Emergency Room Physician Lead, LGH  
Radiology, LGH  
Director, Patient Transfer Network, BCEHS

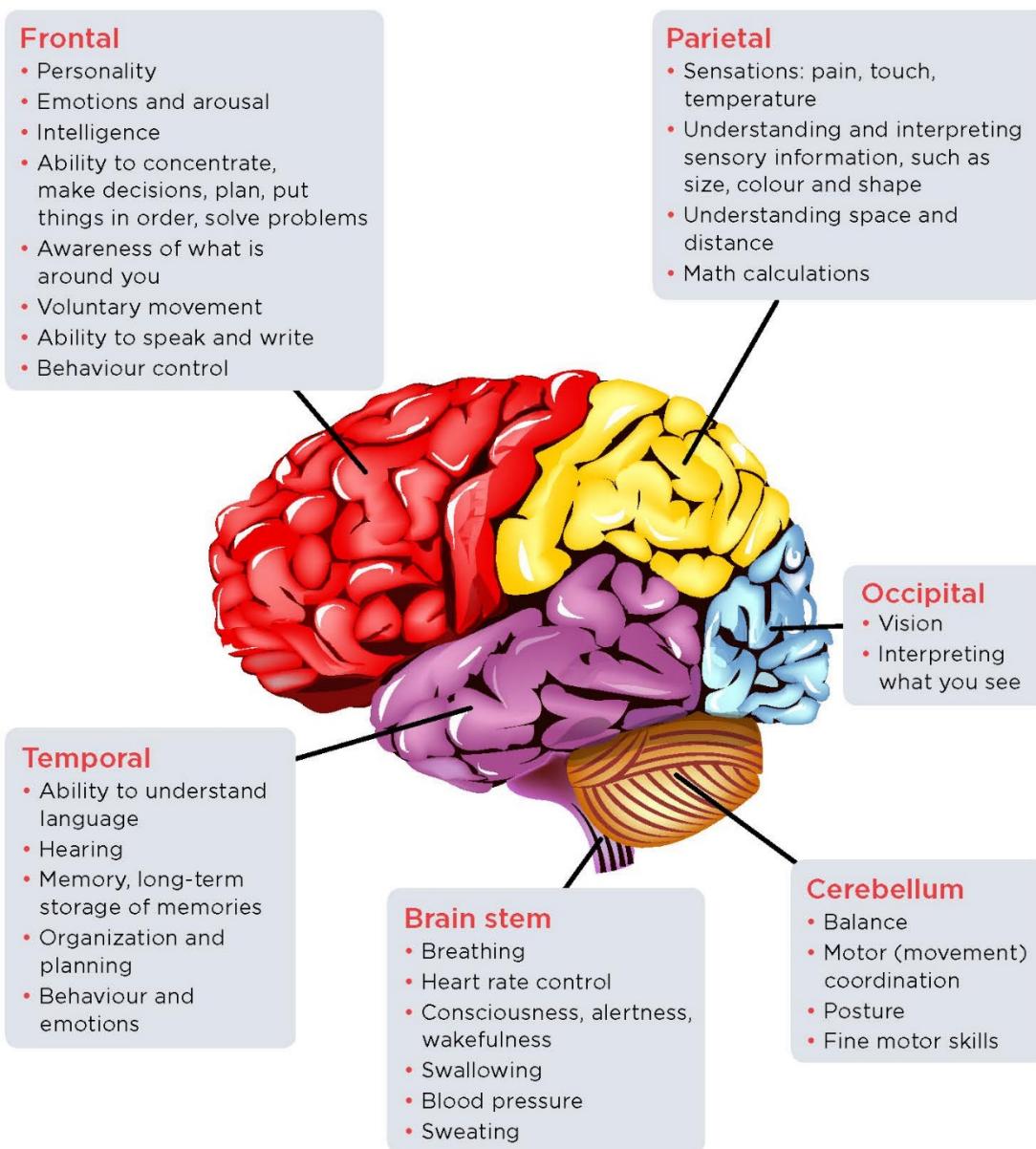
### **(April 2019) SPH protocols**

Manager, Emergency, SPH  
Operations Director, Emergency, SPH  
Medical Physician Director, Emergency, SPH  
Manager, Medicine, SPH  
Operations Director, Medicine, SPH  
Physician Director, Medicine, SPH  
Neurology Head, SPH  
Physician Director, Radiology, SPH  
Director, Patient Transfer Network, BCEHS

## Appendix A: Regions of the Brain

### Regions of the brain and what they control

Each hemisphere is divided into six regions or lobes that control different functions. This chart shows the names of the lobes and their functions:

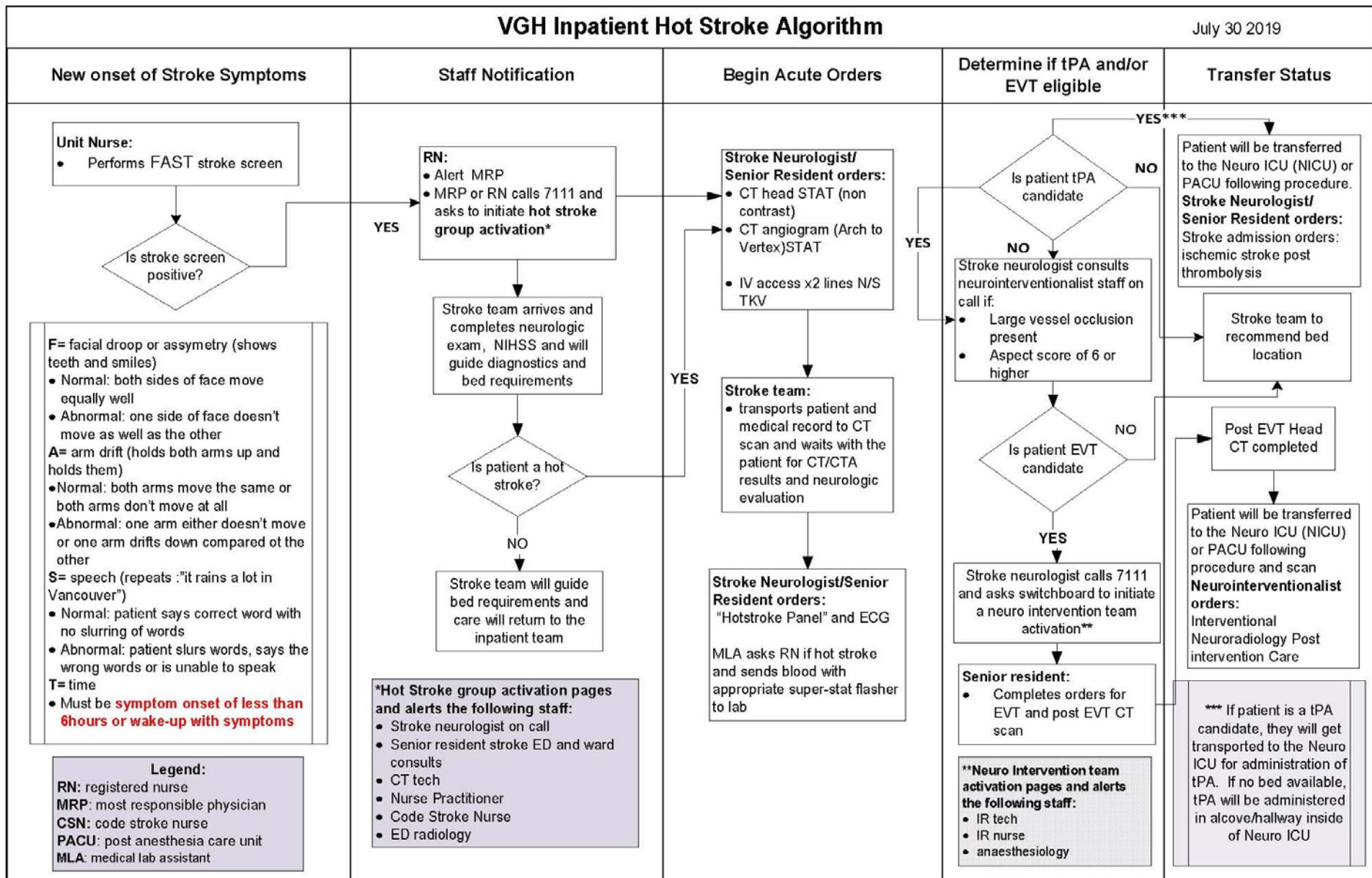


From "My Stroke Journey", Heart and Stroke Foundation of B.C. page 14. Taken from:

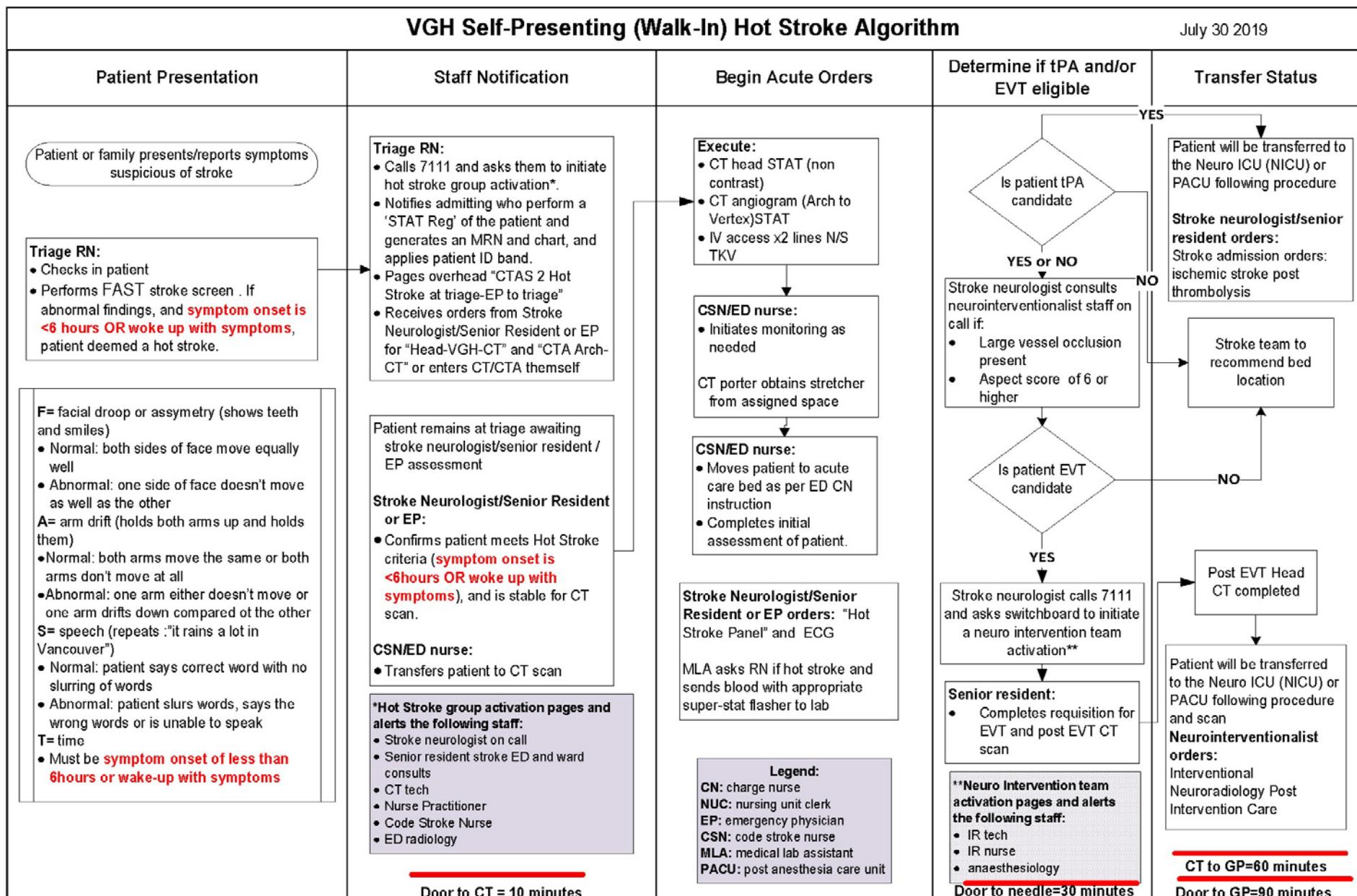
<https://heartstrokeprod.azureedge.net/-/media/pdf-files/what-we-do/publications/enyourstrokejourney30web.ashx?rev=537fe3ed1c55463dbe18c1c14366b81e&hash=7DC993A1D47AD69DAE3E4298591FFD28>

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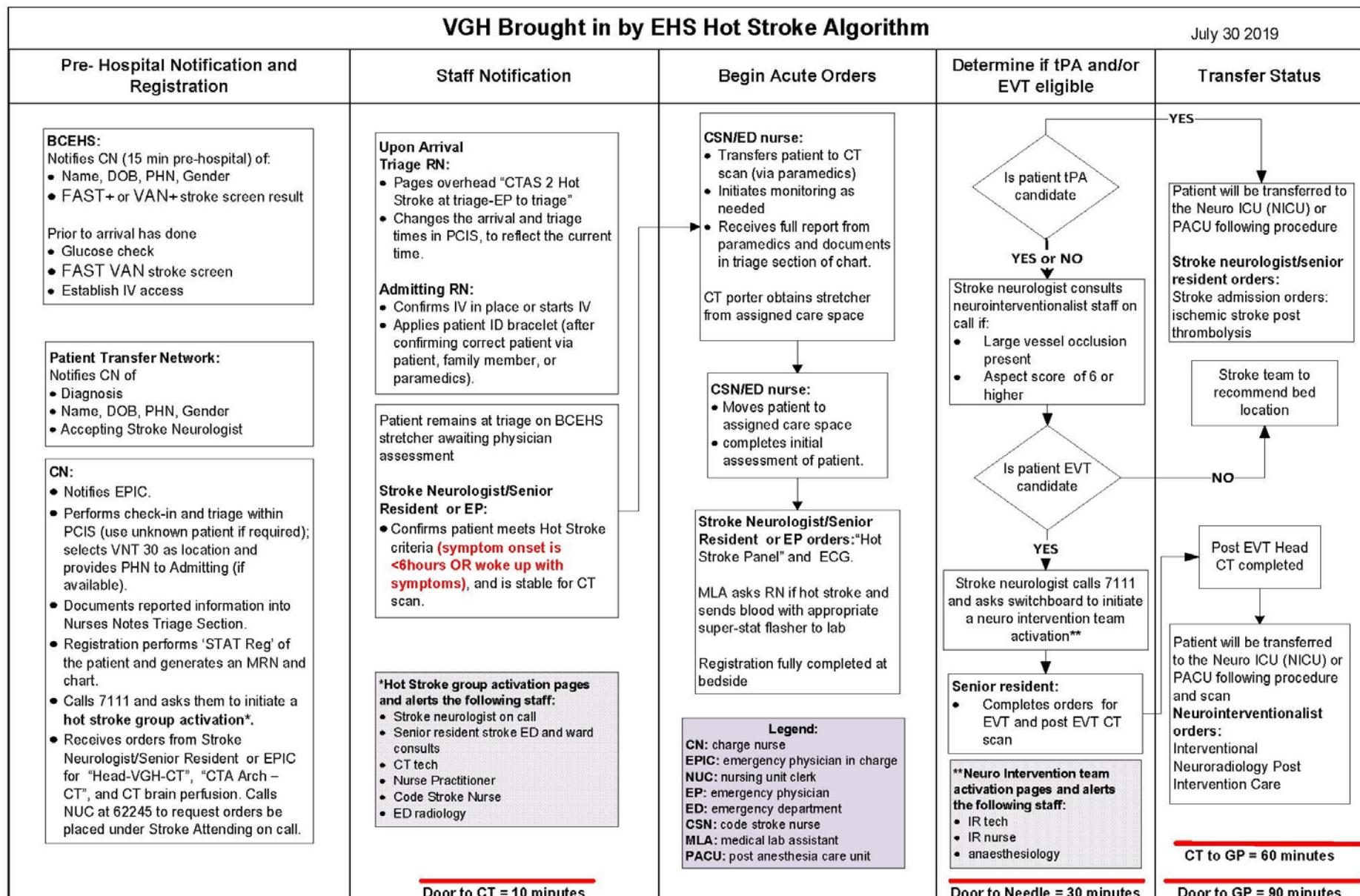
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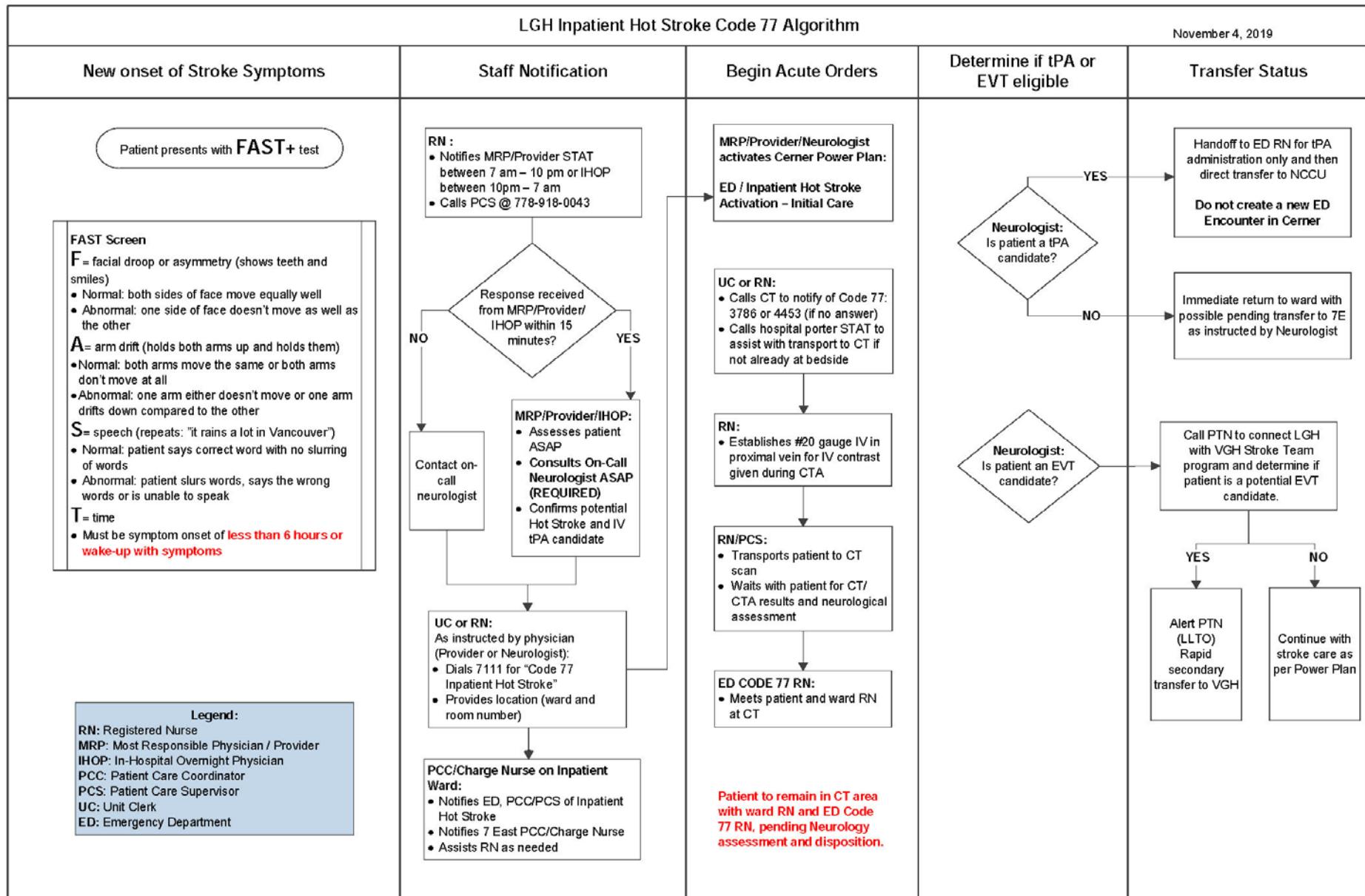
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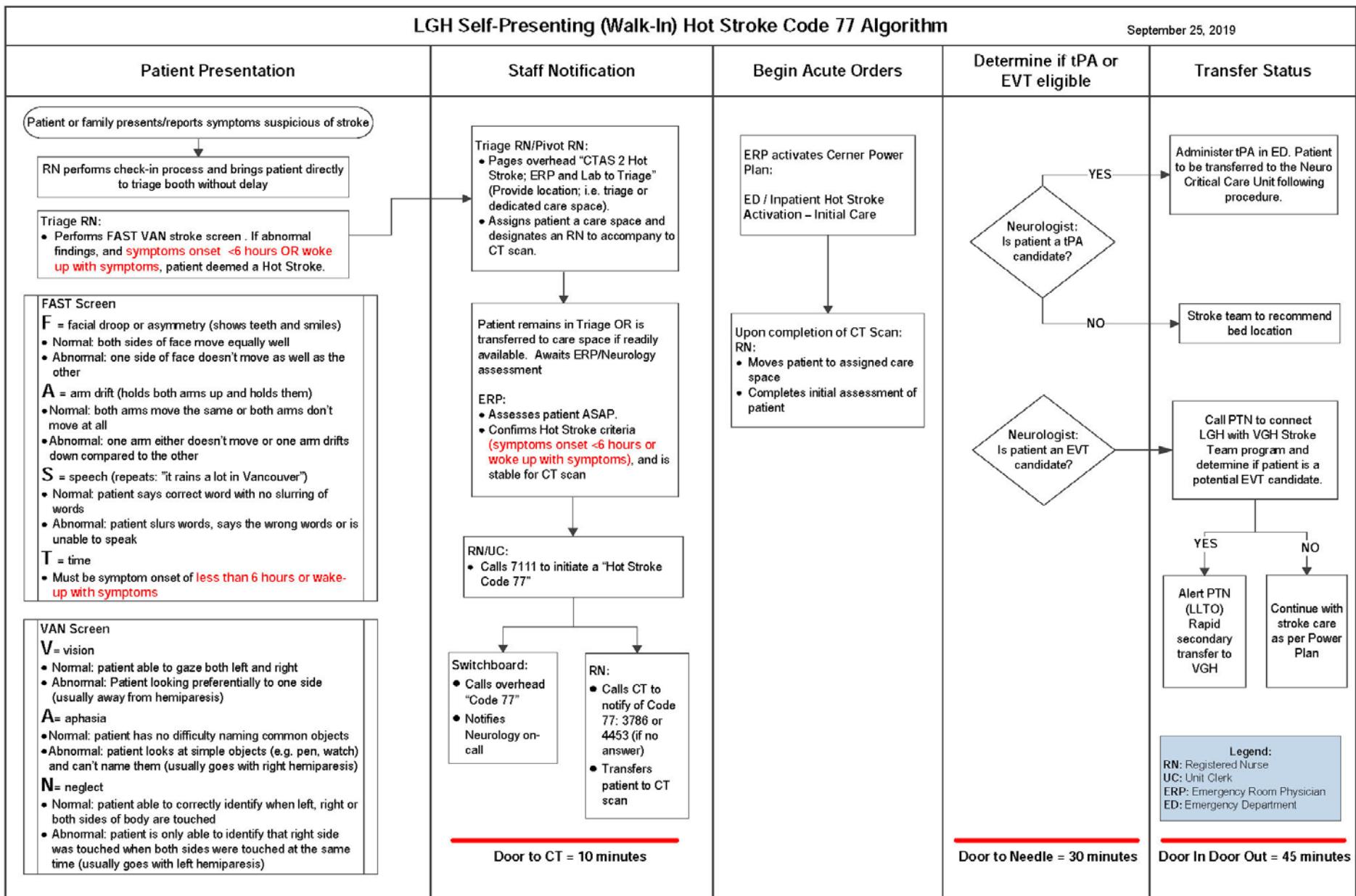
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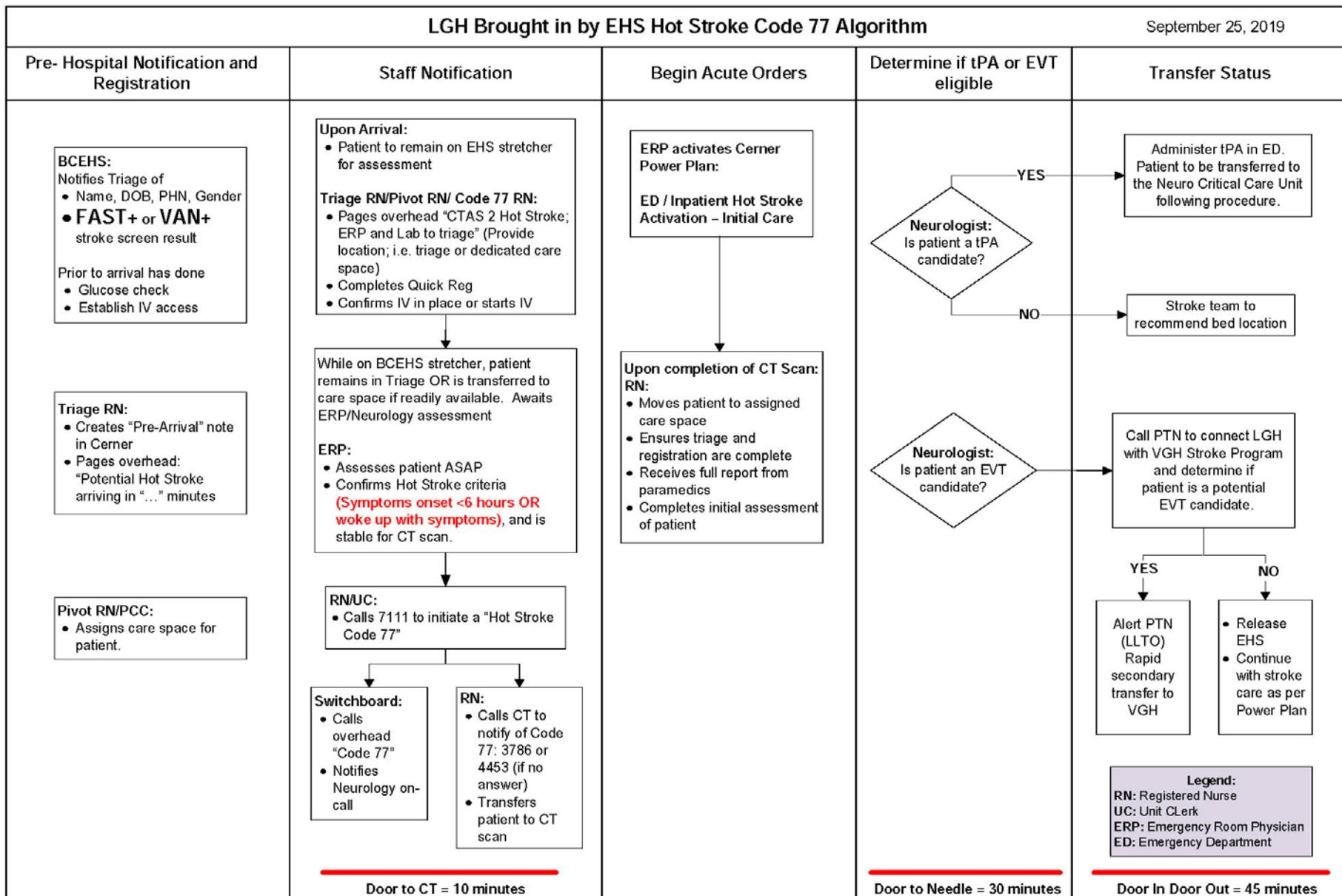
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## **PHC: Hot Stroke Protocol ED and In-Patient (SPH and MSJ)**

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## Appendix B: Assessment, Triage, Management and Prevention of Complications

Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
<b>Hyperacute</b>	<b>Transport Algorithms</b>	Ambulance transport algorithms used to support rapid transport to definitive stroke care for patients across the region	Acute interventions such as thrombolytic therapy and mechanical clot retrieval are time-sensitive, so strategies such as re-directing ambulances to stroke centres helps with earlier assessment, diagnosis, and treatment – resulting in potentially better outcomes for patients. The algorithms reflect the latest best practices ( <a href="http://www.strokebestpractices.ca">www.strokebestpractices.ca</a> )	These are currently being updated to include FAST VAN and will be added once completed  <a href="http://www.strokevan.com">www.strokevan.com</a>
	<b>Assessment and Triage</b>	Pre-printed orders used to expedite access to alteplase or endovascular therapy when appropriate	Pre-printed orders were developed to ensure consistent assessment and triage of patients having a potential stroke as well as alignment with stroke best practices	Visit the <a href="#">VCH</a> or PHC PPO site for site specific PPOs

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	Admitting Processes	Pre-printed orders used to admit patients with a stroke to appropriate next level of care	Pre-printed orders were developed to ensure consistent, best practice stroke care is provided to all patients	Visit the <a href="#">VCH</a> or PHC PPO site for site specific PPOs
	Assessment of Stroke severity	National Institute of Health Stroke Scale (NIHSS) used by clinicians that have successfully completed the online training and certification NIHSS to be administered at minimum: at admission, 24 hours post admission and at discharge	NIHSS provides a quantitative measure of stroke related neurologic deficit as well as evaluates acuity of patients with a stroke, helps guide appropriate treatment and predicts patient outcomes	<a href="https://secure.trainingcampus.net/UAS/Modules/TREES/windex.aspx">https://secure.trainingcampus.net/UAS/Modules/TREES/windex.aspx</a>
	Assessment of Stroke severity	AlphaFIM used by clinicians that have successfully completed required training and online testing certification  Initial assessment to be completed within 72 hours of admission	AlphaFIM scoring can be used as one tool to predict hours of assistance required for daily care as well as support planning and transitions to appropriate rehabilitation services	
		<ul style="list-style-type: none"> <li>• Patient must remain NPO until swallowing screen completed by nursing to ensure safe method of oral intake is established</li> <li>• If patient fails initial screen, referral to SLP or OT should be made, with patient remaining NPO</li> </ul>	<ul style="list-style-type: none"> <li>• Risk of aspiration can lead to further complications including aspiration pneumonia</li> <li>• Oral Care reduces risk of aspiration pneumonia Proper positioning minimizes aspiration</li> <li>• Inadequate nutritional intake can lead to poor functional recovery due to pre morbid</li> </ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	Swallowing & Nutrition (CON'T)	<ul style="list-style-type: none"><li>• Oral care done with HOB @ 30 degrees at all times unless otherwise ordered</li><li>• HOB @ 90 degrees for 30 minutes during and after meals</li><li>• Proper positioning with oral intake (as per OT/SLP)</li><li>• Straws not used unless explicitly recommended</li><li>• Assessment of food and fluid deficits</li><li>• Dietitian (RD) consult required, for assessment of nutrition status and to provide recommendations on appropriate feeding route(s), if patient is NPO, has dysphagia and is on a dysphagia diet, is malnourished, underweight, or if intake is less than 75% for 3 consecutive days</li><li>• Family and caregiver education provided regarding dietary restrictions and rationale</li><li>• <b>REMEMBER:</b> <i>Patients who have had a swallowing assessment, have dysphagia, are receiving enteral feeds or are on a modified diet are at risk for aspiration</i></li><li>• <b>If a patient is not managing secretions or tolerating their diet, they must be made NPO until a swallowing assessment is done by OT/SLP and the dietitian should be consulted.</b></li></ul>	<p>under-nutrition and post stroke weight loss</p> <ul style="list-style-type: none"><li>• Dysphagia and/or low palatability of texture-modified diets can contribute to poor oral food and fluid intake</li></ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	Mobility & Positioning	<ul style="list-style-type: none"> <li>• Initial mobility and balance assessment completed by PT</li> <li>• Safe transfer method assessed and established by PT &amp; OT</li> <li>• Reassessment and progression of mobility as appropriate</li> <li>• Bed positioning and wheelchair assessment and set-up completed by OT. Up to chair at least once per day or as prescribed by PT/OT</li> <li>• Wheelchair positioning: Use of lap tray to support arm and shoulder in neutral position as needed. Use foot rest to support affected leg</li> <li>• Bed positioning schedule: Patient is turned Q2H during day, Q3 to 4H at night. Follow bed positioning sheets for left and right sided weakness as appropriate</li> <li>• Pillow use: pillows used to achieve NEUTRAL positioning, with attention to shoulders (particular attention to affected side)</li> <li>• Affected arm must always be supported when mobilizing or positioning patient</li> <li>• Affected arm must never be pulled. When possible, IV's should not be inserted in the affected arm</li> </ul>	<ul style="list-style-type: none"> <li>• Early mobilization prevents deconditioning and reduces hospital stay</li> <li>• Early mobility assessment and wheelchair set-up contribute to setting discharge goals</li> <li>• Risk of skin breakdown is increased with reduced immobility and reduced sensation</li> <li>• Poor positioning can contribute to contractures, shoulder subluxation, increased pain, compromised skin integrity and poor functional recovery</li> <li>• Monitoring of tolerance will assist with discharge planning</li> </ul>	<p>See <a href="#">Appendix D</a> for positioning sheets. These can be ordered from: Patient Health Education Materials (<a href="#">VCH</a> / <a href="#">PHC</a>)</p>

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<b>Acute</b>	<b>Mobility &amp; Positioning (CON'T)</b>	<ul style="list-style-type: none"> <li>Patient activity tolerance should be progressively increased, with established rest periods</li> <li>Education of families and caregivers on passive range of motion exercises, proper limb positioning and mobilization, as appropriate, e.g.: ambulation with a walker</li> </ul>		
	<b>Fall Prevention</b>	<ul style="list-style-type: none"> <li>Falls risk screening should be done on admission, upon transfer to a new unit or when a significant change in patient status has occurred</li> <li>Individual care plan established for a patient deemed as a falls risk by following the falls protocol</li> <li>Family engaged on safety strategies/interventions</li> </ul>	<ul style="list-style-type: none"> <li>Stroke can cause problems with safety awareness, insight, impulsivity, vision or mobility</li> <li>Patients with weakness, neglect and/or confusion are at risk for falls</li> <li>Risks should be regularly assessed and managed</li> </ul>	Falls and Injury Prevention in Acute Care VCH: <a href="#">D-00-07-30033</a> PHC: <a href="#">B-00-07-10011</a>

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	Skin Integrity	<ul style="list-style-type: none"> <li>Risk of skin breakdown assessed on an ongoing basis</li> <li>Braden scale completed on admission as per protocol. Skin reassessed as condition changes and WOCN consulted as appropriate</li> <li>Mobility and positioning strategies used to minimize skin breakdown risk</li> </ul>	<ul style="list-style-type: none"> <li>Poor mobility, decreased sensation, restless behavior, incontinence, poor nutrition, etc. contribute to increased risk of skin breakdown</li> <li>Mobility and positioning are key items in prevention of skin breakdown</li> </ul>	Braden Risk and Skin Assessment (Adult) <a href="#">BD-00-12-40078</a>
	Elimination	<ul style="list-style-type: none"> <li>Regular bowel care maintained to achieve regularity, avoid constipation and bowel incontinence</li> <li>Foley catheter discontinued as soon as possible or avoided altogether</li> <li>Leg bag used if a Foley catheter is required long term to aid in mobilization</li> <li>Urinary retention or overflow incontinence assessed with bladder scanner as necessary</li> <li>Regular toileting routine used to improve/regain continence</li> <li>Toileting routine established using urinal, on toilet or commode over toilet</li> </ul>	<ul style="list-style-type: none"> <li>Constipation can contribute to urinary incontinence or retention</li> <li>Foley catheters delay bladder continence recovery and cause UTI's</li> <li>Timed voiding helps with bladder control, a major contributor to discharge planning</li> </ul>	Braden Risk and Skin Assessment (Adult) <a href="#">BD-00-12-40078</a>  Indwelling urinary catheter: Guideline to prevent catheter associated urinary tract infections (CAUTI) – Adult VCH: <a href="#">D-00-07-30110</a> PHC: <a href="#">B-00-13-10121</a>  Indwelling Urethral Catheter: Care and Management (Short Term) – Adult VCH: <a href="#">D-00-07-30108</a>

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
<b>Acute</b>	<b>Pain Management</b>	<ul style="list-style-type: none"> <li>• Pain assessed and regular analgesic given when appropriate</li> <li>• Behavioural pain scale used when patient is unable to communicate</li> <li>• Sources of pain considered (e.g. neuro-pathic, musculoskeletal, inflammatory, positioning, and/or post- procedural pain)</li> <li>• Affected arm and shoulder positioning monitored</li> <li>• Pain medications coordinated with therapies</li> </ul>	<ul style="list-style-type: none"> <li>• Many pain inducing factors are commonly present with stroke</li> <li>• Poor shoulder positioning contributes to poor sleep/poor functional limb recovery, and decreased ADL independence</li> </ul>	Pain Assessment and Management in the Older Adult with Cognitive and/or Language Impairment VCH: <a href="#">D-00-07-30068</a> PHC: <a href="#">BD-00-04-40075</a>
	<b>Sleep</b>	<ul style="list-style-type: none"> <li>• Sleep patterns assessed</li> <li>• Sleep log started</li> <li>• Barriers to sleep considered (e.g. apnea, pain, reversed sleep wake cycle, medications, environment)</li> <li>• Sleep aids considered</li> <li>• Patient out of bed/mobilized during day as appropriate</li> <li>• Caffeinated beverages in the evening avoided</li> <li>• Referral considered for: <ul style="list-style-type: none"> <li>◦ PT and/or OT(for positioning especially if pain is present)</li> <li>◦ Respiratory Therapist (RT) or physician consultation for sleep apnea (C-PAP)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Poor sleep will affect recovery time. Poor sleep may also contribute to depression, resulting in poor rehab participation</li> </ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	<b>Cognitive, Perceptual, Behavioural and Emotional Function</b>	<ul style="list-style-type: none"> <li>• OT consulted for cognitive assessment</li> <li>• Cognitive and Perceptual screening to be done</li> <li>• Presence of depression, delirium and dementia assessed</li> <li>• Physical restraints avoided</li> </ul>	<ul style="list-style-type: none"> <li>• Cognitive issues may be multifactorial</li> <li>• Depression is very common [40% at 1 month] in stroke survivors, but may be confused with lack of motivation or initiative or flat affect</li> </ul>	Cognitive Evaluation and Intervention Guideline for the Adult Population <a href="#">BD-00-07-40018</a>  <a href="#">Patient Health Questionnaire (PHQ) Screeners</a>
	<b>Communication</b>	<ul style="list-style-type: none"> <li>• S-LP assessment completed</li> <li>• Communication strategies (as per S-LP) implemented</li> <li>• Family encouraged and/or educated on strategies</li> <li>• Communication strategy documented and communicated with the rest of the interdisciplinary team</li> </ul>	<ul style="list-style-type: none"> <li>• Communication problems are very common after stroke</li> <li>• Communication deficits may disrupt interactions with the entire healthcare team, as well as inhibit participation in rehab</li> </ul>	When required, access Interpreter Services via the <a href="#">Provincial Language Service</a>  <a href="#">Heart and Stroke - Communication</a>
	<b>Venothromboembolism (VTE) Risk</b>	<ul style="list-style-type: none"> <li>• Patient assessed for VTE risk and prophylaxis prescribed</li> <li>• Prophylaxis measures followed</li> </ul>	<ul style="list-style-type: none"> <li>• Acute illness contributes to a "cytokine storm" that greatly increases risk of clotting related complications</li> <li>• Decreased mobility and other common stroke risk factors also increase this risk</li> <li>• Early mobilization is important</li> </ul>	Venous Thromboembolism Prevention Guideline: Thromboprophylaxis <a href="#">BD-00-07-40070</a>

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	<b>Diabetes Management</b>	<ul style="list-style-type: none"> <li>• Glucose levels assessed</li> <li>• Education for secondary risk management provided</li> <li>• Patient discharged with appropriate counseling/ medication to manage diabetes</li> <li>• Referral to/Assessment by:           <ul style="list-style-type: none"> <li>◦ Registered Dietitian</li> <li>◦ Endocrinologist</li> <li>◦ Diabetes Outpatient Clinic</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Diabetes is a risk factor for stroke and often is undiagnosed prior to hospitalization</li> <li>• Acute illness may exacerbate existing diabetic issues</li> </ul>	Hypoglycemia in Diabetes: Adult Management Protocol VCH: <a href="#">BD-00-13-40096</a> PHC: <a href="#">BD-00-13-40096</a>  Capillary Blood Glucose Monitoring using the Accu-Chek blood glucose meter (Inform II or Performa) <a href="#">BD-00-12-40009</a>
	<b>Hypertension and/or Hypotension</b>	<ul style="list-style-type: none"> <li>• Awareness of acceptable BP parameters for individual patients</li> <li>• Blood pressure managed as per physician orders</li> <li>• Patient discharged with appropriate counseling/ medication to manage hypertension</li> <li>• Consider Referral to/Assessment by:           <ul style="list-style-type: none"> <li>◦ Clinical pharmacist to talk with patient and family about medications</li> <li>◦ Dietitian to review diet and education for management of hypertension/hypotension</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Hypertension is a risk factor for stroke and frequently presents in patients with stroke</li> <li>• Hypertension may also be a physiological response to poor brain perfusion</li> <li>• Uncontrolled hypertension can contribute to re-stroke, or cardiac problems</li> <li>• Extreme hypertension and hypotension are associated with worsened morbidity</li> </ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	<b>Hyperlipidemia</b>	<ul style="list-style-type: none"> <li>• Hyperlipidemia managed as per physician orders</li> <li>• Consider Referral to/Assessment by: <ul style="list-style-type: none"> <li>◦ Clinical pharmacist to talk with patient and family about medications</li> <li>◦ Dietitian to review diet and education for management of hyperlipidemia</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Hyperlipidemia is a risk factor for stroke and is frequently present in patients with stroke</li> </ul>	
	<b>Cerebral edema, hemorrhage into stroke area, or extension of stroke</b>	<ul style="list-style-type: none"> <li>• Physician orders followed for monitoring of GCS</li> <li>• NIHSS administered at minimum: at admission, 24 hours post admission and at discharge; or more frequently as per site policy</li> <li>• Physician notified immediately if neurological symptoms worsen</li> </ul>	<ul style="list-style-type: none"> <li>• The risk for edema is highest in the first 48 to 72 hours</li> <li>• Physician may consider surgery if neurologic status worsens, e.g. decompressive craniectomy especially with large volume MCA and cerebellar stroke</li> </ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	<b>Seizure</b>	<ul style="list-style-type: none"> <li>Patient monitored for seizures (focal or generalized)</li> <li>Physician notified immediately if you suspect patient is having or has had a seizure</li> <li>Necessary safety precautions taken for those who have had a seizure in the past</li> </ul>		Seizure Management (Adult/Pediatric) <a href="#">BD-00-07-40059</a>
	<b>Pneumonia</b>	<ul style="list-style-type: none"> <li>Patient monitored for signs and symptoms of pneumonia such as increased oxygen needs, fever, change in sputum, increased respiratory and/or heart rate</li> <li>Patient's chest monitored by doing chest auscultation at least once per shift</li> <li>Swallowing screen and /or swallow assessment completed (see information under swallowing and nutrition)</li> </ul>	<ul style="list-style-type: none"> <li>Patients with dysarthria and/or dysphagia, significant immobility, reduced level of consciousness, and poor oral hygiene are at higher risk for developing pneumonia</li> </ul>	

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Stream of Care Continuum	Area of Focus	Intervention	Rationale	Supporting Documents and/or Policies
Acute	Oral Hygiene	<ul style="list-style-type: none"><li>• Oral care routine has been established</li><li>• Family involved in oral care if they are interested</li><li>• Consider referral to occupational therapy for ADL assessment and recommendations</li></ul>	<ul style="list-style-type: none"><li>• Patients with difficulty performing activities of daily living may have difficulty performing oral care</li><li>• Poor oral hygiene can lead to bacterial colonization in the mouth and can place the patient at higher risk for aspiration pneumonia</li></ul>	
	Hyperthermia	<ul style="list-style-type: none"><li>• Temperature monitored as per doctor's orders</li><li>• Physician notified if temperature becomes elevated</li></ul>	<ul style="list-style-type: none"><li>• Fever can worsen patient outcome after stroke</li></ul>	

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## Appendix C: Educational Resources

Educational Resources	URL
<b>American Stroke Association</b>	<a href="http://www.strokeassociation.org">www.strokeassociation.org</a>
<b>Neurological health Charities Canada</b>	<a href="https://mybrainmatters.ca/">https://mybrainmatters.ca/</a>
<b>Brainstreams</b>	<a href="http://www.brainstreams.ca">www.brainstreams.ca</a>
<b>Canadian Best Practice Recommendations</b>	<a href="http://www.strokebestpractices.ca">www.strokebestpractices.ca</a>
<b>Centre for Patients – GF Strong</b>	<a href="http://centreforpatients.vch.ca/gfstrong">http://centreforpatients.vch.ca/gfstrong</a>
<b>Communication Assistance for Youth and Adults (CAYA)</b>	<a href="http://www.cayabc.org/">http://www.cayabc.org/</a>
<b>Disability Alliance BC</b>	<a href="http://www.disabilityalliancebc.org/">http://www.disabilityalliancebc.org/</a>
<b>Getting On With the Rest of your Life After Stroke</b>	<a href="http://www.lifeafterstroke.ca">www.lifeafterstroke.ca</a>
<b>Heart and Stroke Foundation of Canada</b>	<a href="http://www.heartandstroke.ca/">http://www.heartandstroke.ca/</a>
<b>Health Link BC</b>	<a href="https://www.healthlinkbc.ca/">https://www.healthlinkbc.ca/</a>
<b>Quicr online stroke course (University of Calgary)</b>	<a href="http://ecme.ucalgary.ca/quicrstrokecourse/">http://ecme.ucalgary.ca/quicrstrokecourse/</a>
<b>National Institute for Neurological Disorders and Stroke</b>	<a href="http://www.ninds.nih.gov">www.ninds.nih.gov</a>
<b>National Stroke Association</b>	<a href="http://www.stroke.org">www.stroke.org</a>
<b>NIHSS</b>	<a href="http://www.nihstrokescale.org">www.nihstrokescale.org</a>
<b>Sodium 101</b>	<a href="http://www.sodium101.ca">www.sodium101.ca</a>
<b>Stroke Engine</b>	<a href="http://strokengine.ca/">http://strokengine.ca/</a>
<b>Stroke Recovery Canada</b>	<a href="http://www.strokerecoverycanada.com">www.strokerecoverycanada.com</a>
<b>Stroke Recovery Association of B.C.</b>	<a href="http://strokerecoverybc.ca/">http://strokerecoverybc.ca/</a>
<b>Stroke Training and Awareness Reosources (STARS)</b>	<a href="http://www.strokecorecompetencies.org/no_de.asp?id=home">http://www.strokecorecompetencies.org/no_de.asp?id=home</a>
<b>The Aphasia Institute</b>	<a href="http://www.aphasia.ca">www.aphasia.ca</a>
<b>Uniform Data System for Medical Rehab (alphaFIM)</b>	<a href="https://www.udsmr.org/">https://www.udsmr.org/</a>
<b>Vancouver Stroke Program</b>	<a href="http://www.vancouverstrokeprogram.com/">http://www.vancouverstrokeprogram.com/</a>

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## Appendix D: Positioning



# Positioning - Left Sided Weakness

**Caution: DO NOT pull on affected arm.**



### Lying on Affected Side

- One or two pillows for head.
- Affected shoulder blade brought forward so that it's not trapped under the trunk.
- Place affected leg straight so that it is in line with trunk.
- Place pillows behind trunk and under unaffected leg.



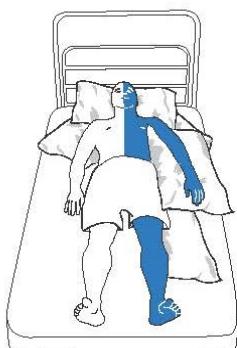
### Lying on Unaffected Side

- One or two pillows for head.
- Affected arm supported on two pillows & shoulder blade brought forward.
- Place affected leg on one/two pillows so that leg is straight and in line with trunk.
- Place a pillow behind trunk.
- Bend unaffected hip and knee.



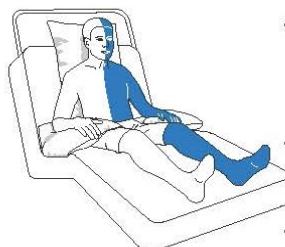
### In Wheelchair

- Back fully supported in upright position.
- Shoulders level and head in midline.
- Feet flat on floor or footrests.
- Affected arm supported on lap tray.
- Fingers out straight and supported.



### Lying on Back (if desired)

- Place a pillow under each shoulder and the head (three in total).
- Place affected arm on pillow.
- Ensure feet in neutral position. (Prop with pillow on the outside of leg if necessary.)



### Sitting in Bed

- Sitting in bed is desirable for short periods only (less than 30 minutes) if eating/drinking in bed.
- Raise knee gatch 10-20 degrees before the head of bed is raised.
- Sitting upright well supported by pillows.
- Place both arms on pillows.

Adapted from Chest Heart & Stroke Scotland

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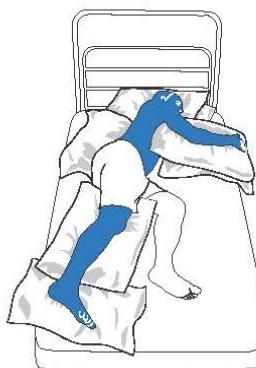
## Positioning - Right Sided Weakness

**Caution: DO NOT pull on affected arm.**



### Lying on Affected Side

- One or two pillows for head.
- Affected shoulder blade brought forward so that it's not trapped under the trunk.
- Place affected leg straight so that it is in line with trunk.
- Place pillows behind trunk and under unaffected leg.



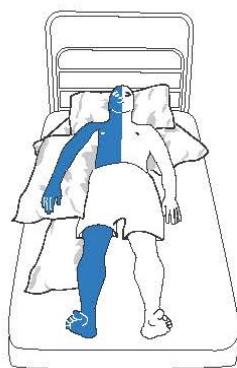
### Lying on Unaffected Side

- One or two pillows for head.
- Affected arm supported on two pillows & shoulder blade brought forward.
- Place affected leg on one/two pillows so that leg is straight and in line with trunk.
- Place a pillow behind trunk.
- Bend unaffected hip and knee.



### In Wheelchair

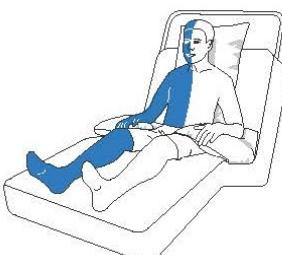
- Back fully supported in upright position.
- Shoulders level and head in midline.
- Feet flat on floor or footrests.
- Affected arm supported on lap tray.
- Fingers out straight and supported.



### Lying on Back

#### (if desired)

- Place a pillow under each shoulder and the head (three in total).
- Place affected arm on pillow.
- Ensure feet in neutral position. (Prop with pillow on the outside of leg if necessary.)



### Sitting in Bed

- Sitting in bed is desirable for short periods only (less than 30 minutes) if eating/drinking in bed.
- Raise knee gatch 10-20 degrees before the head of bed is raised.
- Sitting upright well supported by pillows.
- Place both arms on pillows.

Adapted from Chest Heart & Stroke Scotland

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## Appendix E: Educational Resources



### Stroke Services BC Position Statement

Date of Decision: June 2017

Anticipated Date of Review: Spring 2019

Topic: Definition of a 'hot stroke'

**Summary Recommendation:** In BC, a person is deemed to be having a "Hot Stroke" if BC EHS arrives to the patient within 6 hours of last seen normal or wake-up stroke. A similar definition can be applied to any site where an individual arrives if not by EHS, as well as to those experiencing stroke in-hospital.

#### Context for Change:

A wide variety of definitions existed across BC about what was considered a 'hot stroke'. This designation has important implications for EHS transport and hospital response to pre-notification. It also reflects the medical urgency of a stroke in progress, even if the individual doesn't travel by ambulance or experiences their stroke while already in hospital. Coming to a provincial consensus on 'hot stroke' would ensure consistent communication and understanding across the many stakeholders involved in hyperacute stroke care. With the evolving landscape of hyperacute stroke care and the introduction of endovascular therapy as standard of care, it was critical to revise this definition and make it consistent.

#### Description:

"Hot Stroke" is a term that is used colloquially to describe someone experiencing a stroke in progress. It is generally in the first few hours from symptom onset or recognition, but the definition was widely variable across BC. Having a consistent definition that is commonly understood helps to define and reinforce treatment urgency in stroke, influences bypass and transport decisions, and has impact on how teams react to pre-notification of a person coming to the hospital with symptoms of stroke. A 'hot stroke' definition, in combination with consistent stroke screening in the field, pre-notification to receiving hospitals, rapid access to comprehensive imaging and early access to evidence-based medical therapies for stroke can significantly improve stroke care for British Columbians.

This definition does extend beyond the 4.5 hour window in which tPA (the clot-busting drug for ischemic stroke) can be provided; this is intentional and recognizes the increasing opportunity for endovascular therapy ([EVT] mechanical clot-retrieval). EVT is currently recommended out to six hours, but recent evidence is continuing to expand that window with some patients benefiting from EVT up to 24 hours after symptom onset. As the literature around hyperacute interventions for stroke evolves, this definition of "hot stroke" will also evolve.

Last updated May 2018

**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<sup>1,2</sup>. The next iteration of Canadian Stroke Best Practice Recommendations (due out later in 2018) is anticipated to increase the time window for EVT to 24 hours.

**Rationale/Consensus:**

The recent shifts in the landscape of hyperacute stroke therapy to include EVT have prompted significant review of systems that could improve access to care for this life- and disability-saving procedure. While tPA remains a viable treatment option out to 4.5 hours (earlier is better), extending the hot stroke window to six hours will ensure that as many people potentially appropriate for EVT can be identified, without unduly burdening the system. The state of evidence in this area continues to rapidly evolve and it's possible this definition of 'hot stroke' will continue to evolve as well. When in doubt, it is more important to treat new symptoms of stroke as medical emergency with potential to treat rather than focus solely on the time. This is particularly important for people with symptoms suggestive of large vessel occlusion. SSBC leadership, in partnership with clinical leaders across the province and country, will continue to monitor the evolving literature and will review the provincial stroke definition as needed.

**Approved by:**

- Hyperacute Focus Table
- Provincial Stroke Steering Committee

**Considerations:**

It is of critical importance to have a consistent interpretation of 'hot stroke', even in places where people are arriving at sites that do not provide EVT. With the ever expanding time window for selected patients, we all need to work together to ensure that all patients potentially eligible for acute intervention, even if significant distances need to be considered, are urgently transported and assessed. While this does create additional system burden and potential increase in patient volumes, the benefit to patients (decreased mortality, decrease in long-term disability) outweighs the risk of the increased burden on the system.

**For questions, please contact:**

Katie White, Manager, Stroke Services BC [Katie.white@phsa.ca](mailto:Katie.white@phsa.ca)

<sup>1</sup> 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.

<sup>2</sup> 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.

Last updated May 2018