

Emergency Department: Stroke Update 2019

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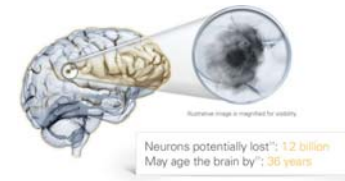
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Mission Stroke Program – TJC Comprehensive Stroke Center

- Mission Hospital achieved Comprehensive Stroke Center certification 2017
- Angel and McDowell hospitals have achieved Acute Stroke Ready designation
- Dr. Alex Schneider – Medical Director for CSC Program
 - 7 Neuro-hospitalists 24/7 on site at Mission and available via Tele-Stroke for acute stroke consult 24/7
 - 3 Neuro-interventional-radiologist available 24/7 for endovascular therapy in acute stroke
- Decision to treat will be collaborative with ED and Neurology
 - Consult with no acute therapy recommended: admit at local hospital
 - Consult with IV tPA recommended – Administer (Drip and ship if regional ED)
 - Consult with potential for IR recommended – Neuro may activate Code IR Stroke (Rapid transfer if regional ED)
 - ICH and SAH acute management and disposition – contact Neurology
- Protocols for the care of potential stroke patients are outlined in Stroke Care Process Model (CPM) Ischemic Stroke, ICH and SAH located on MOD



Acute Stroke Treatment – Don't Delay

Activate Code Stroke:

- < 4 hours with a measurable neurologic deficit - activate CODE STROKE
- 4-24 hours and RACE score ≥ 5 or large-vessel occlusion (LVO) suspected - activate CODE STROKE

Call:

- Mission Hospital – Call 511
- Regional Hospital – Call Mission Direct for Tele-Stroke activation

Care:

- Utilize ED Code Stroke powerplan – Includes orders for IVs, Stat Labs, Stat Imaging, Dysphagia Screening
 - Advanced neuroimaging with non-contrast CT, CTA head/neck, and CT perfusion are all pre-checked as part of the CODE STROKE powerplan. As a result, patients will receive 2 doses of IV contrast as supported by the stroke literature.
- Monitor BP - Be prepared to administer IV medication to lower **BP if > 185/110**
- Documentation of NIH Stroke Scale

EMS RACE Procedure

- RACE is a validated tool used to determine stroke severity and localizing the area affected by the stroke.
- The RACE scale is a simplification of the NIHSS scale using those items with a higher ability to predict the presence of a large vessel occlusion.
- EMS performs RACE score on all patients with a positive, or suspected positive stroke screen.
- RACE score ≥ 5 = Suspect LVO

[EMS Race Score Video](#)

ITEM	Instruction	Result	Score
Facial Palsy	Ask patient to show their teeth (smile)	Absent (symmetrical movement)	0
		Mild (slight asymmetrical)	1
		Moderate to Severe (completely asymmetrical)	2
Arm Motor Function	Extending the arm of the patient 90° (if sitting) or 45° (if supine)	Normal to Mild (limb upheld more than 10 seconds)	0
		Moderate (limb upheld less than 10 seconds)	1
		Severe (patient unable to raise arm against gravity)	2
Leg Motor Function	Extending the leg of the patient 30° (in supine)	Normal to Mild (limb upheld more than 5 seconds)	0
		Moderate (limb upheld less than 5 seconds)	1
		Severe (patient unable to raise leg against gravity)	2
Head & Gaze Deviation	Observe eyes and head deviation to one side	Absent (eye movements to both sides were possible and no head deviation was observed)	0
		Present (eyes and head deviation to one side was observed)	1
Aphasia (R side)	Difficulty understanding spoken or written words. Ask patient to follow two simple commands: 1. Close your eyes. 2. Make a fist.	Normal (performs both tasks requested correctly)	0
		Moderate (performs only 1 of 2 tasks requested correctly)	1
		Severe (Cannot perform either task requested correctly)	2
Agnosia (L side)	Inability to recognize familiar objects. Ask patient: 1. "Whose arm is this?" (while showing the affected arm) 2. "Can you move your arm?"	Normal (recognizes arm, and attempts to move arm)	0
		Moderate (does not recognize arm or is unaware of arm)	1
		Severe (does not recognize arm and is unaware of arm)	2
RACE SCALE TOTAL			

Slide 4

AS8 should we still include this or remove?
Andie Slivinski, 4/12/2019

Does anyone know what time it is?

- Activate Code Stroke for any patient presenting with stroke symptoms last time known normal < 4 hours (up to 24 if concerned for LVO)
- Consider Alteplase IV:
 - FDA approved < 3 hours from symptom onset
 - Off label use out to 4.5 hours for select patients
 - If administering off label, document risk/benefit in note
- Endovascular therapy devices FDA approved up to **24 hours**
 - Neurologist/neurointerventional radiologist may activate **IR Stroke Now** page



Target Stroke Goals:

- Door to CT <25 minutes
- Door to Needle < 30 minutes 50% of the time ,< 45 minutes 75% of the time and <60 minutes for all patients
- Door to Groin < 60 minutes

Alteplase Prescribing In Acute Ischemic Stroke

	<i>Patients who should be considered for treatment:</i>	<i>Patients in whom treatment benefits should be carefully weighed against risks:</i>	<i>Patients in whom the risks outweigh the benefits, treatment is known to be harmful, and/or treatment with IV alteplase is contraindicated:</i>
0-4.5 hour window	<ul style="list-style-type: none"> • Age \geq 18 • Diagnosis of ischemic stroke causing measurable neurological deficit (including minor strokes judged to be disabling) • Last known normal \leq 3 hours • Baseline CT of the head with NO evidence of intracranial hemorrhage • BP < 185/110mmHg (can use antihypertensives to lower BP prior to administration of alteplase. If medications are needed patient must demonstrate stability prior to alteplase administration and maintain BP < 180/105 for 24 hours) • POC glucose level >50 mg/dL and < 400 mg/dL (if glucose out of range, can normalize glucose and treat with alteplase if symptoms remain/otherwise eligible for alteplase) • Patients on antiplatelet mono or dual therapy 	<ul style="list-style-type: none"> • Last known normal between 3 – 4.5 hours • Minor stroke with symptoms judged to be non-disabling <p><u>Current/Recent Events:</u></p> <ul style="list-style-type: none"> • Recent MI \leq 3 months ago • Major surgery \leq 14 days • Major trauma \leq 14 days • Hx of GI bleed • Hx of GU bleed • Lumbar dural puncture in last 7 days <p><u>Concurrent Conditions:</u></p> <ul style="list-style-type: none"> • Current use of warfarin with INR \leq 1.7 • Diabetic hemorrhagic retinopathy or other hemorrhagic ophthalmic conditions • Pregnancy • Postpartum period (< 14 days) • Suspected ischemic stroke presenting with seizure • Left heart thrombus • Acute Bleeding diathesis • Previous SAH with confirmed secured aneurysm • Intracranial aneurysm, vascular malformation • Extra-axial intracranial neoplasm <p><u>Additional 3-4.5 hour Considerations</u></p> <ul style="list-style-type: none"> • Age > 80 • Hx of prior stroke and diabetes • NIHSS > 25 • Mild disabling stroke 	<ul style="list-style-type: none"> • Last known normal > 4.5 hrs or unknown • Evidence of ICH on imaging • Clinical Diagnosis of SAH • Elevated BP > 185/110 despite treatment • Current use (\leq48 hours) of a direct thrombin inhibitor or direct factor Xa inhibitor with elevated coags • Current use (< 24 hours) of low-molecular weight heparin (treatment doses ONLY- prophylaxis dosing ok) • Active internal bleeding • Platelet count < 100,000/mm³, INR > 1.7, aPTT > 40 sec, PT > 15 sec (DO NOT delay treatment if no reason to suspect coagulopathy) • Significant head trauma within previous 3 months • Ischemic Stroke in previous 3 months • Active or suspected infective endocarditis • Intracranial or intraspinal surgery within previous 3 months • Arterial puncture at non-compressible site in previous 7 days • Known or suspected aortic arch dissection • GI bleed in last 21 days • History of previous ICH • CT demonstrates multilobar infarction/ extensive hypoattenuation • Intra-axial intracranial neoplasm

Intracerebral Hemorrhage

- ED Hemorrhagic Stroke (ICH/SAH Non-Traumatic) Powerplan can be used
- Key Clinical Components
 - Maintain BP less than **160/90**
 - Cardene still primary choice for hypertension management
 - Contains reversal agents based on patients coagulation status
- Blood in Head Algorithm for transport from regional facility
 - If bleed identified as non-traumatic or unsure, contact Neurology via Mission Direct

Blood Pressure Guidelines/Parameters

Stroke Type	BP goal
Ischemic Stroke treated with IV Alteplase and/or going to interventional for thrombectomy	<ul style="list-style-type: none">✓ Pre-treatment goal <185/110✓ Post IV Alteplase for 24 hours goal <180/105
Ischemic Stroke/TIA no acute treatment	<ul style="list-style-type: none">✓ Permissive hypertension up to 220/120
ICH	<ul style="list-style-type: none">✓ BP <160/90
SAH	<ul style="list-style-type: none">✓ BP <140/90

Transient Ischemic Attack

Risk stratification for TIA with ABCD ₂ score		
ABCD ₂	Criteria	Points
Age	≥ 60 years	1
Blood pressure	≥ 140/80	1
Clinical features	Unilateral weakness	2
	Speech impairment without weakness	1
Duration of Sx	>60minutes	2
	10-59 minutes	1
Diabetes	Yes	1

Score	2day-risk for stroke	Recurrence within 90days
0-3	Low	1.0%
4-5	Moderate	4.1%
6-7	High	8.1%

JAMA 2000;284:2901-2906

- If focal signs/symptoms remain present, then manage the patient as a stroke (**ED TIA/Subacute Stroke Powerplan coming soon)
- Imaging:
 - Non-contrast MRI is the preferred neuroimaging modality; CT is alternative
 - For anterior circulation (ICA territory) TIA, carotid vascular imaging to exclude symptomatic carotid stenosis is recommended.
 - For posterior circulation TIAs (brainstem, cerebellar, or cortical visual symptoms), CTA neck/head or MRA neck/head is recommended
- Routine blood work to exclude metabolic abnormalities, clotting abnormalities or hypoglycemia is recommended with EKG and/or continuous cardiac monitoring to exclude AFib and other variants
- Echo and lipids should be performed, but can be done on a non-emergent basis
- ABCD₂ score should be used for risk stratification and disposition planning.
- Consider anti-platelet therapy and other vascular risk modification (e.g. BP reduction, statin use, lifestyle modification and smoking cessation).
- Consider admission for any of the following: AFib/flutter identified, ABCD₂ > 3, Acute infarction seen on MRI, Symptomatic carotid stenosis
- If discharging from ED, PCP follow-up within 7-10 days and Mission Neurology follow-up within 2 weeks

Stroke Program Cerner Documentation

- Use *ED Code Stroke Power Plan* to obtain CT/CTA head/neck and labs for INITIAL orders.
 - ****DO NOT** Use ED Code Stroke CT/CTA order for patients in which stroke is not suspected, order CT/CTA individually. ******
- Document last time known well in note.
- Ongoing management in ED:
 - For AIS to be treated with IV Alteplase/Activase , order *Alteplase/Activase for Ischemic Stroke* Power Plan (can be found as subplan within ED Code Stroke powerplan OR as standalone subplan)
 - Document education provided to patients/families regarding risks and benefits of IV thrombolytic therapy.
 - For ICH/SAH (non-traumatic), order *ED Hemorrhagic Stroke (ICH/SAH Non-Traumatic)* Power Plan
- Stroke Neurologist will enter note in Cerner Power note for consults completed via telemedicine.

Monitoring

- Frequent vital signs and neuro checks per protocol.
- Maintain BP per neurologist recommendations.
- Monitor for changes in symptoms.
- Monitor for post-alteplase complications:
 - Angioedema – Utilize Angioedema Post-tPA Treatment Subplan
 - Hemorrhage – Utilize Hemorrhage Post tPA Subplan at Mission Hospital Only
- Regional EDs should facilitate rapid transfer and call neurologist.

When working in the region: Tele-Stroke Requirements

- Rapid Recognition of Stroke Symptoms
- Early activation of the Code Stroke System using standardized protocols
- Rapid diagnostics interpretation (CT, Lab)
- Activation and rapid response from Tele-Stroke provider
- RN/MD presence in the room during Tele-Stroke assessment
- Expedient administration of alteplase
- Ongoing monitoring and assessment
- Hand-off communication
- Arrangements/Acceptance for transfer if required

Super STAT

Who ya gonna call??

- Code Stroke activation
 - Mission Hospital **call 511**
 - Regional hospitals **call Mission Direct** to activate Tele-Stroke consult
- Acute Ischemic Stroke care
 - Neurology vs. Hospitalist management at Mission Hospital
 - Hospitalists will admit non-tpa treated ischemic strokes and TIAs
 - Patients treated with IV/IA thrombolytics or endovascular therapy will be admitted by neurology.
 - Admission in Regional Hospital –
 - Unless transferring to receiving physician at Mission, follow standard admission protocol
- Non-traumatic Hemorrhagic stroke care (ICH/SAH) – Contact Neurology
- Non-Ruptured cerebral aneurysm care – Call neurology and they will direct patient follow-up
- TIA – Admit to hospitalist, consult neurology as needed

