Stony Brook Medicine

Stroke Program Orientation for Medical Staff

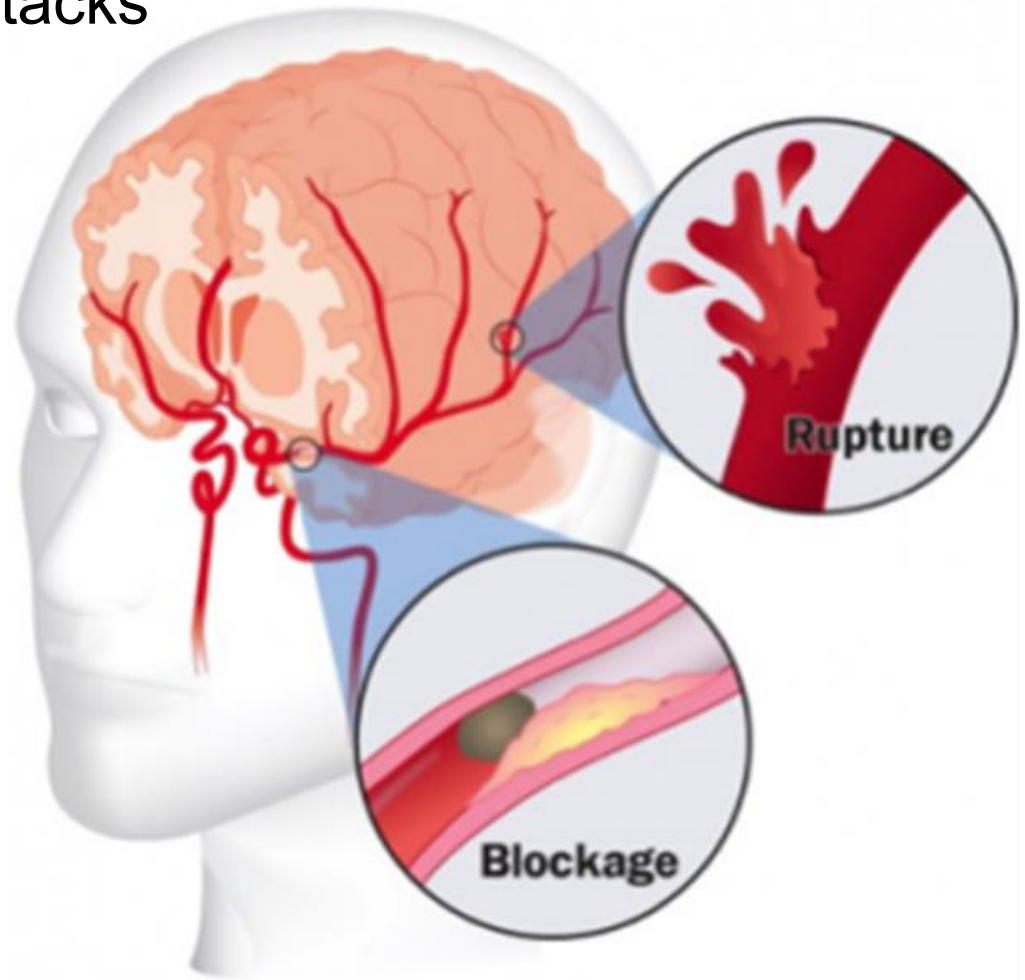
STROKE PROGRAM ORIENTATION – MEDICAL STAFF

Objectives:

- Familiarize with the criteria for CODE BAT (Brain Attack Team) activation
- Familiarize with the criteria for CODE CSI (Complex Stroke Intervention) at SBUH Main Campus
- Familiarize with acute stroke response time targets
- Understand responsibilities of the Primary Team during an Inpatient Stroke Code
- Verbalize where to locate stroke-related clinical practice guidelines and protocols
- Familiarize with Joint Commission, New York State Department of Health and Stroke:Get-With-The-Guidelines core measures and quality requirements

STROKE FACTS

- Each year, about 795,000 people experience a new or recurrent stroke
  - Approximately 610,000 of these are first attacks
  - 185,000 are recurrent attacks
- Stroke ranks 4th among all causes of death
  - accounts 1 of every 19 deaths



2026 Heart Disease and Stroke Statistics: A Report of US and Global Data From the American Heart Association

STROKE FACTS

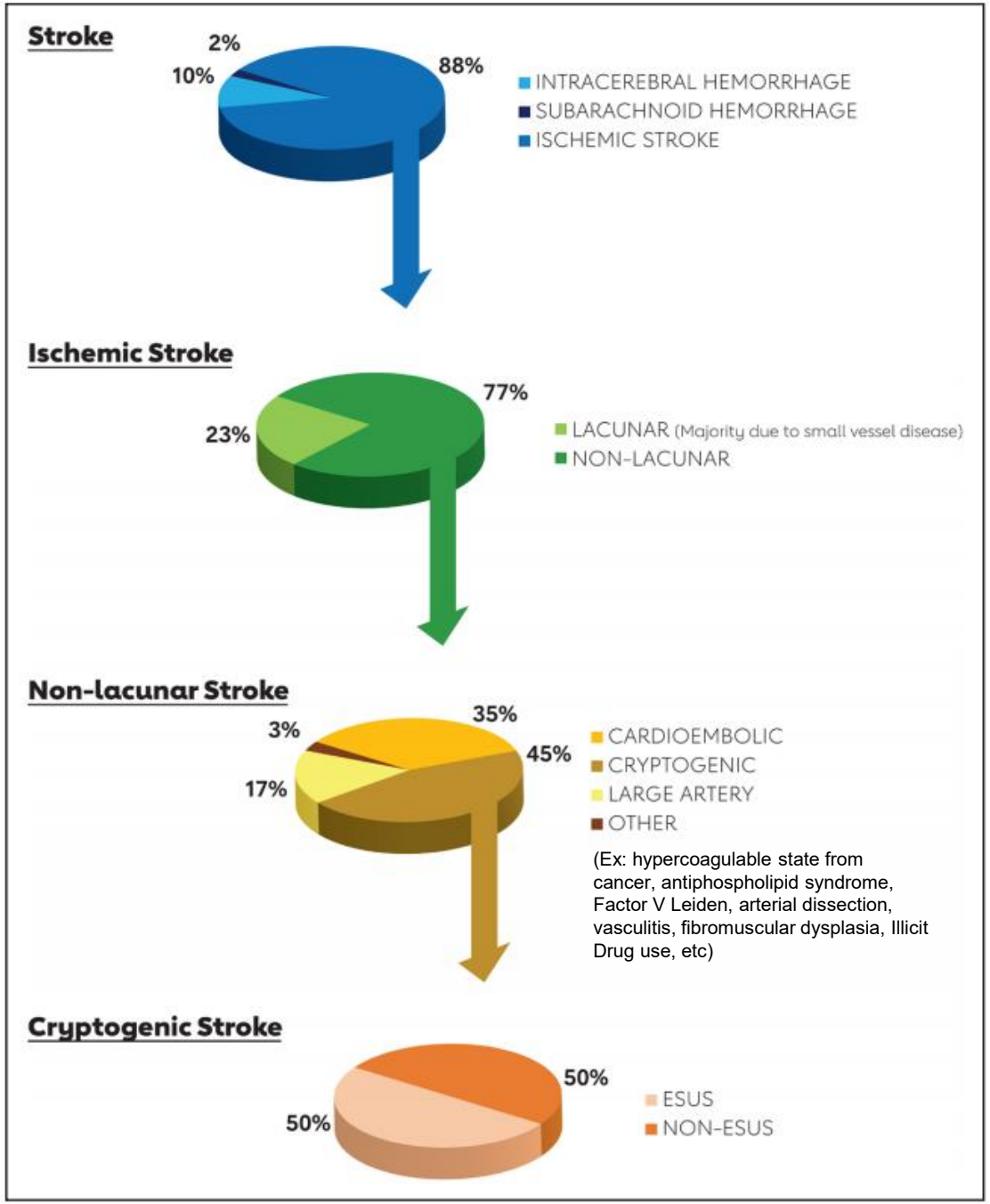
- 87% of the stroke risk could be attributed to modifiable risk factors such as HTN, obesity, DM, HLD, and renal dysfunction

- 47% could be attributed to behavioral risk factors such as smoking, sedentary lifestyle, and an unhealthy diet

- The direct and indirect cost of stroke in the United States is about $50 billion

- Common complications after stroke include both short-term complications such as seizures, DVT, PE, urinary infection, aspiration pneumonia, decubitus ulcers, and constipation and long-term sequelae, including pain syndromes, pseudobulbar affect, depression and anxiety, cognitive impairment and dementia, epilepsy, gait instability, and falls and fractures

STROKE FACTS



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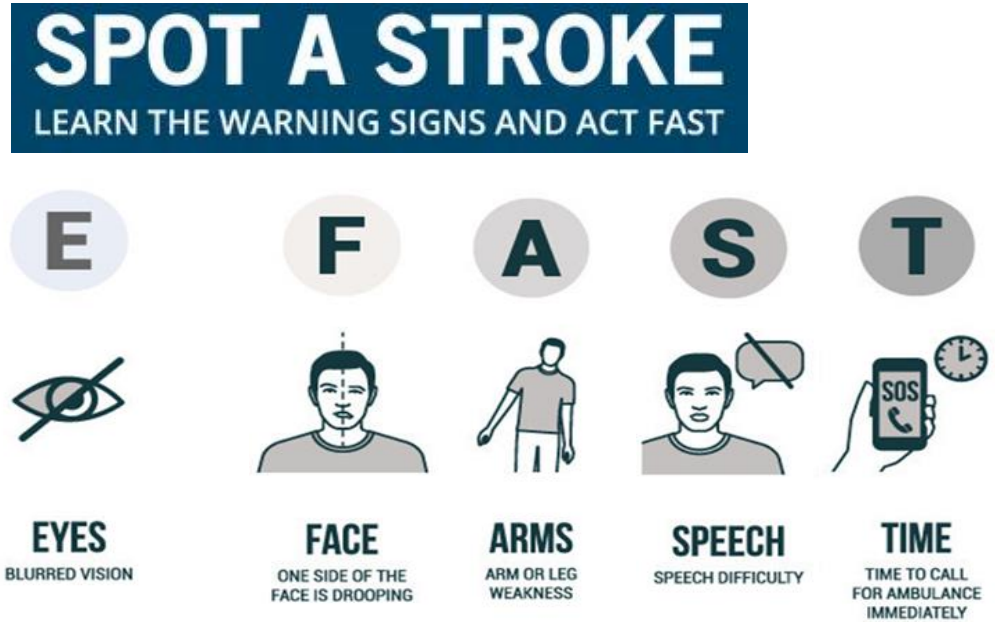
Kleindorfer DO, et al 2021 Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack: AHA/ASA. Stroke. 2021 Jul;52(7)

TIME IS BRAIN

ACUTE STROKE IS A MEDICAL EMERGENCY

	Neurons Lost
Per Stroke	1.2 billion
Per Hour	120 million
Per Minute	1.9 million
Per Second	32 000



J.L.Saver, Time is Brain-Quantified, Stroke. 2006;37:263-266.

MOBILE STROKE UNIT (MSU)

- **Dispatched by Suffolk County EMS/911**
- **Assessment on scene**
  - CC ED RN, CT Tech, Paramedic
  - Stroke Neurologist via telemedicine
- **Imaging on scene immediately sent to PACS**
  - CT Head to rule-out hemorrhage
  - CTA Head to evaluate for large vessel occlusion
- **Treatment provided**
  - IV thrombolytic for eligible patients
  - KCentra for bleeding due to anticoagulant
  - Critical care medications and equipment such as for blood pressure and airway emergencies
- **Disposition to the appropriate hospital coordinated by Stony Brook EMS**
  - Stony Brook or nearest Comprehensive Stroke Center for complex stroke:
    - ICH, SAH
    - Large Vessel Occlusion requiring endovascular intervention
  - Nearest Primary Stroke Center for non-interventional stroke care

ACUTE STROKE MANAGEMENT

Target Response Times:

- **EMS recognition of stroke in the field** → hospital pre-notification (Ex: last known well time, stroke scale screen)
- **MD Evaluation**: ≤10 minutes
- **Stroke Team**: ≤ 15 minutes
- **CT Initiation Time** : ≤ 25 minutes, stretch goal ≤ 15 minutes
- **Lab result** : ≤ 45 minutes ; ONLY the assessment of blood glucose level must precede the administration of IV thrombolytic unless there is a suspicion of abnormal hematologic or coagulation test.
- **IV thrombolytic administration** : ≤ 60 minutes, stretch goal ≤ 45 minutes
- **Mechanical Thrombectomy: First Pass** : ≤ 60 minutes for Transfers and Mobile Stroke Unit;

  ≤ 90 minutes for patients presenting directly to Stony Brook ED

ACUTE ISCHEMIC STROKE MANAGEMENT

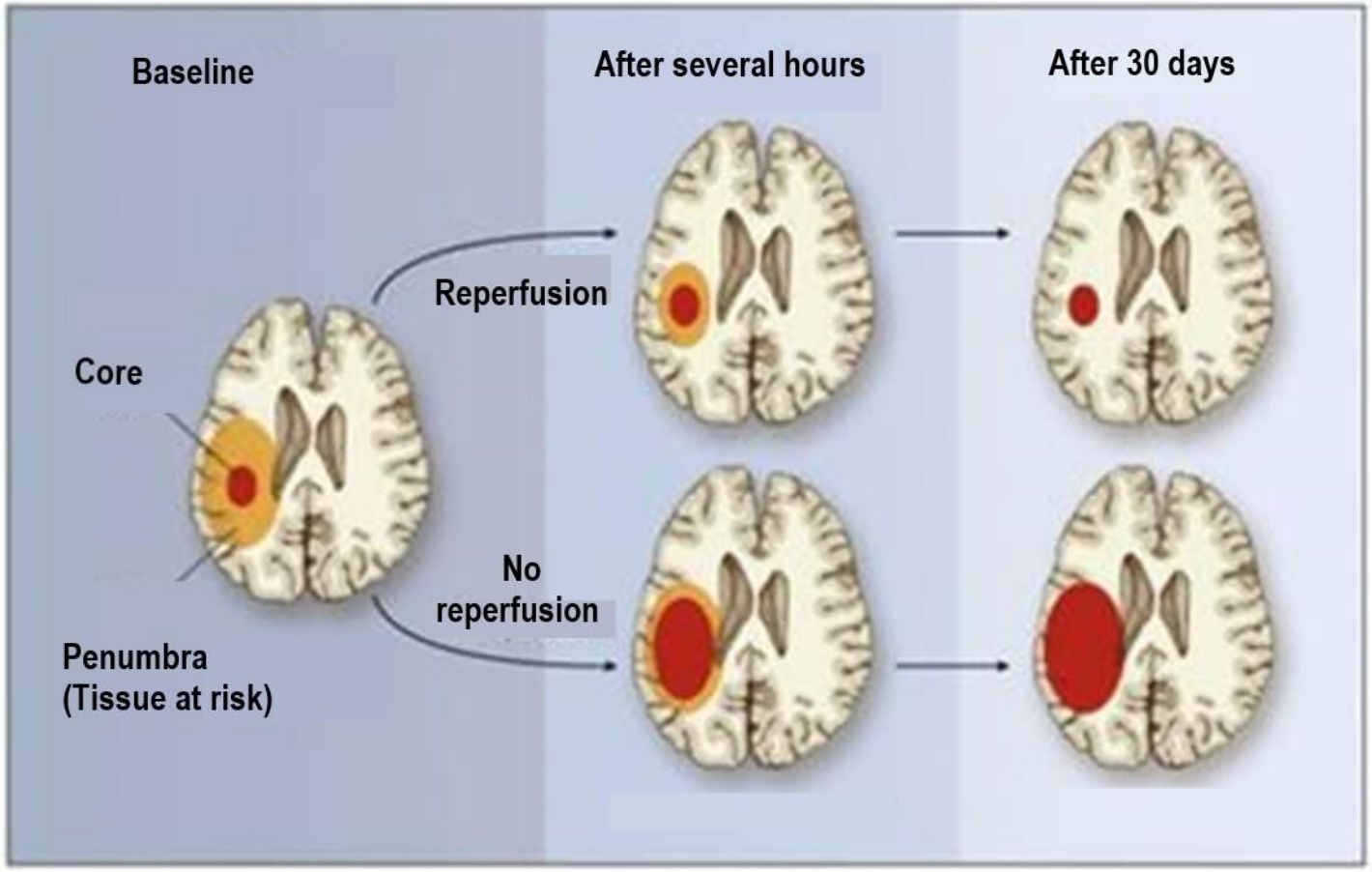
Rationale for rapid evaluation and treatment

- At the onset of stroke symptoms, the stroke is evolving.
- Rapid clot lysis reperfuses ischemic tissue limiting the eventual size of the infarct
- Timely restoration of blood flow in ischemic stroke patients is effective in reducing long-term morbidity.

Ischemic Penumbra

- brain tissue at risk of progressing to infarction but is still salvageable if re-perfused.

- generally located around an infarct core which represents the tissue which has already infarcted or is going to infarct regardless of reperfusion.



ACUTE ISCHEMIC STROKE TREATMENT:

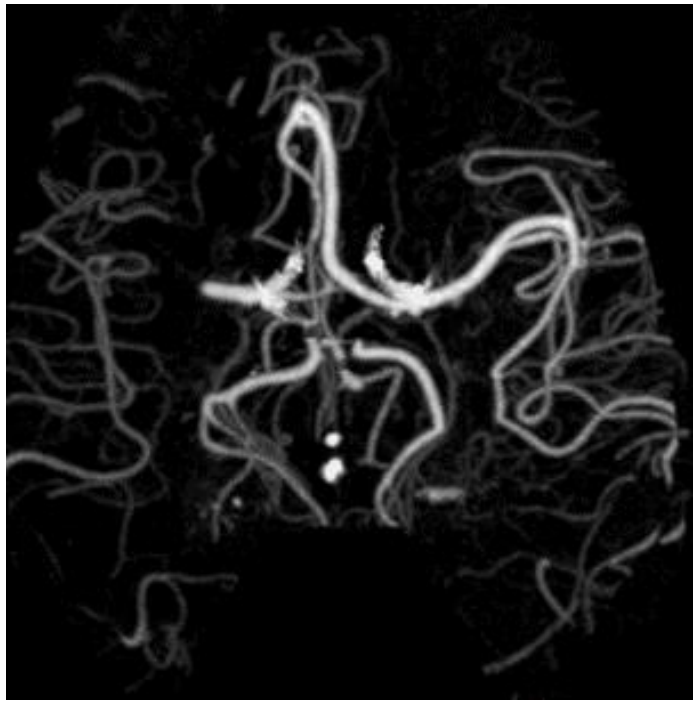
- IV thrombolytic for eligible patients with last known well time up to 4.5 hours
- IV thrombolytic for eligible patients in the MRI-guided Wake-up stroke protocol
  - Tenecteplase (TNKase), first choice
  - Alteplase (Activase)

Tenecteplase

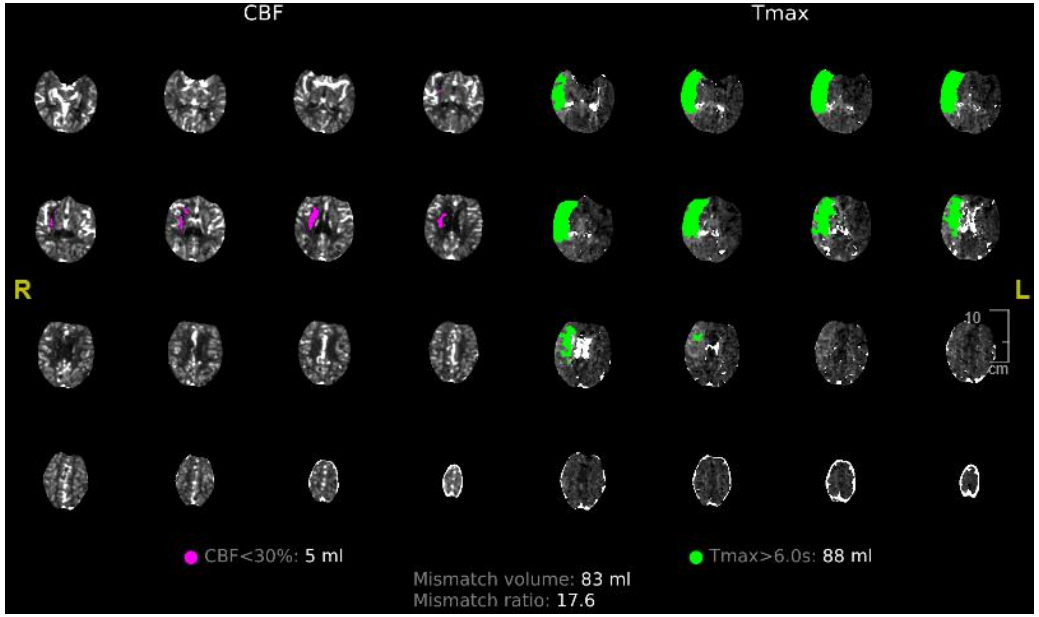
Alteplase

ACUTE ISCHEMIC STROKE TREATMENT:

- Mechanical thrombectomy for eligible patients with large vessel occlusion

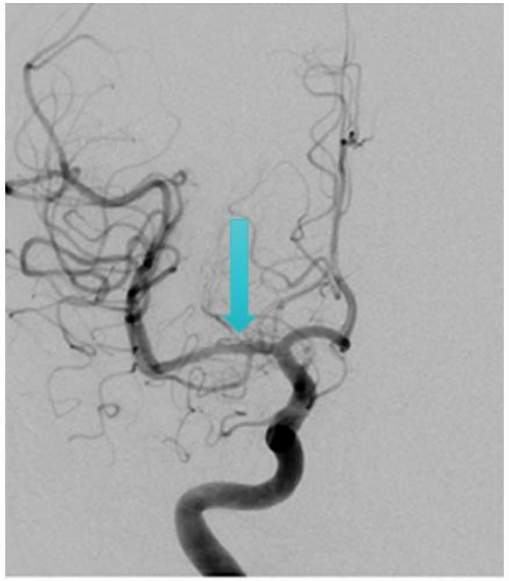


CTA with Right MCA Occlusion



CT Perfusion

Pre-thrombectomy



Post-thrombectomy

JOINT COMMISSION PRIMARY STROKE CORE MEASURES

STK-1 VTE prophylaxis on the day of or the day after hospital admission.
STK-2 Antithrombotic therapy at hospital discharge.
STK-3 Anticoagulation for Atrial fibrillation/flutter at hospital discharge.
STK-4 IV t-PA initiated at this hospital within 3 hours of time last known well.
STK-5 Antithrombotic therapy by the end of hospital day 2.
STK-6 Statin medication at hospital discharge.
STK-8 Patient and/or caregiver stroke education: EMS Activation/calling 911, need for follow-up after discharge, medications prescribed at discharge, personal risk factors for stroke and warning signs and symptoms of stroke.
STK-10 Rehabilitation services assessment

- ✓ LIPs must be mindful of the specific time of the core measures for compliance.
- ✓ Reason(s) must be documented in the medical record if a core measure is not implemented for the patient

  Example:
  - No antithrombotic started by hospital day 2 secondary to concern for bleeding.
  - No intensive statin on discharge due to patient refusal of statin recommendation.
  - No PT or OT evaluation needed as patient is back to baseline, no symptoms from stroke, ambulating steady

JOINT COMMISSION COMPREHENSIVE STROKE CORE MEASURES

CSTK 01 – Initial NIH Stroke Scale score
CSTK 02 - Modified Rankin Score at 90 Days
CSTK 03a - Severity Measurement Performed : Hunt and Hess Scale performed for SAH patients
CSTK 03b – Severity Measurement Performed: ICH Score performed for ICH patients
CSTK 04 - Procoagulant Reversal Agent Initiation for ICH patients
CSTK 05a - Hemorrhagic Transformation for IV t-PA patients
CSTK 05b - Hemorrhagic Transformation for IA t-PA and/or Endovascular Reperfusion Therapy patients
CSTK 06 - Nimodipine Treatment Administered
CSTK 07 - Median Time to Revascularization
CSTK 08 - Thrombolysis in Cerebral Infarction (TICI) post-treatment reperfusion grade
CSTK 09 - Arrival Time to Skin Puncture
CSTK 10 - Modified Rankin Score at 90 Days
CSTK 11 - Timeliness of Reperfusion: Arrival Time to TICI 2B or Higher
CSTK 12 - Timeliness of Reperfusion: Skin Puncture to TICI 2B or Higher

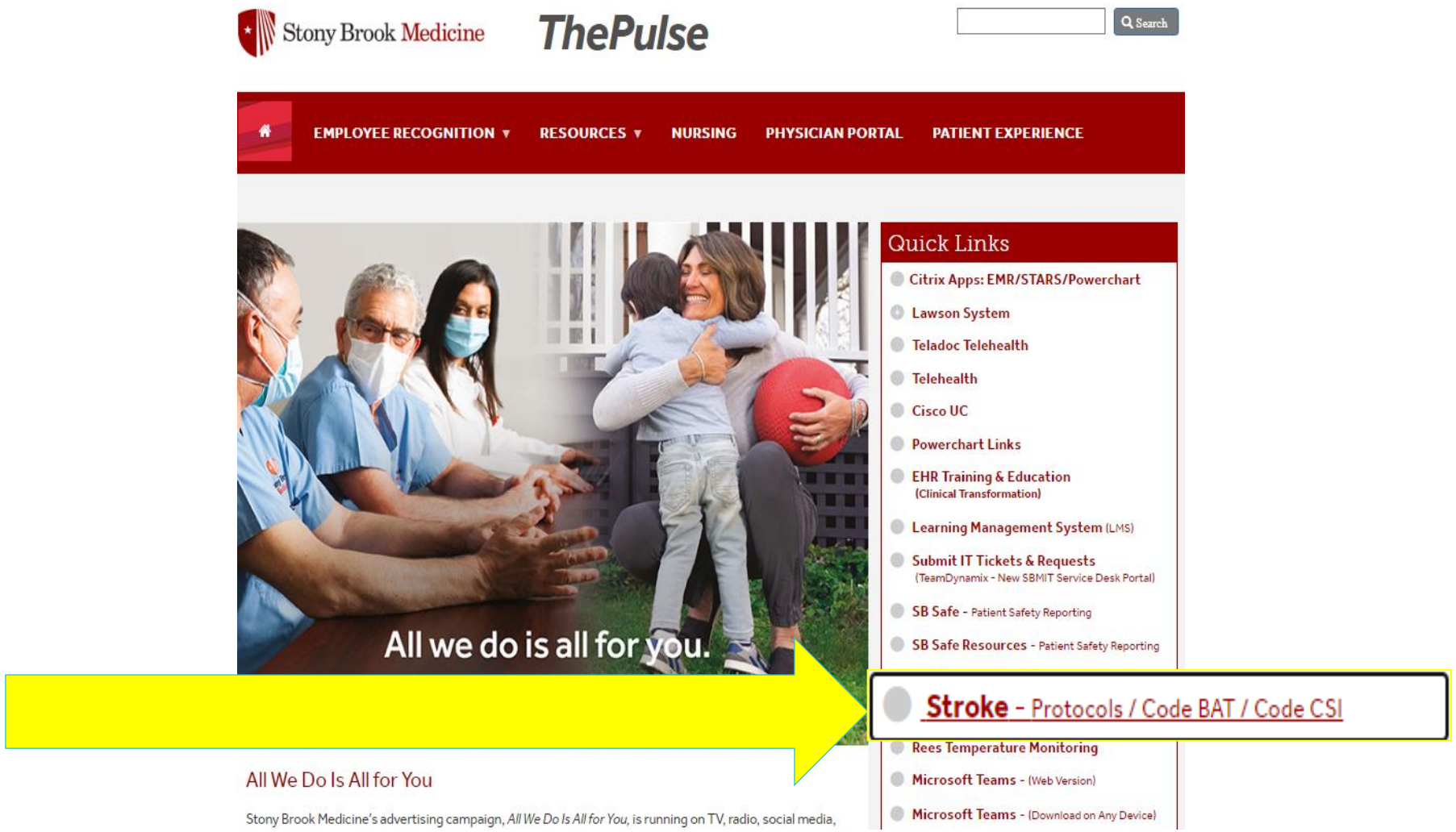
REQUIREMENTS FOR NEW YORK STATE AND GET-WITH-THE-GUIDELINES:

- Annual 8 hours of cerebrovascular-related continuing education for Physicians, NP, PAs and RNs taking care of stroke patients
- Dysphagia Screen before being given any food, fluids, or medication by mouth
  - RN or LIP completes bedside swallow evaluation using the Yale Swallow Protocol
  - If indicated, formal swallow evaluation by Speech and Language Pathologist
  - For patients who failed swallow evaluation and need to be on an antithrombotic: Consider Aspirin Per Rectum or place NGT for patients who need Plavix (Clopidogrel), Brilinta (Ticagrelor) or oral anticoagulant
- HgbA1C
- Lipid profile
- **Intensive statin therapy:**
  - Lipitor (Atorvastatin) ≥ 40mg, Crestor (Rosuvastatin) ≥ 20mg
  - Need documentation of reason if intensive statin dose is not ordered at patient discharge
- **Stroke-Diabetes measures**
  - Diabetes Treatment (diet or medication, follow-up for diabetes management at discharge), Therapeutic lifestyle recommendation (diet, target BMI ≤ 25, increasing physical activity), antihyperglycemic medication with proven CVD benefit (GLP-1 receptor agonist or SGLT-2 inhibitor)
  - Need documentation of reason if antihyperglycemic medication with proven CVD benefit is not ordered at discharge
- modified Rankin Score documentation at discharge
- NIH Stroke Scale score documentation at discharge

STROKE CLINICAL PRACTICE GUIDELINES

- Guidelines for the early management of patients with acute ischemic stroke (AHA/ASA 2026)
- Diagnosis, Workup, Risk Reduction of Transient Ischemic Attack in the Emergency Department Setting (AHA/ASA 2023)
- Diagnosis and Management of Cerebral Venous Thrombosis (AHA 2024)
- Guidelines for the management of spontaneous ICH (AHA/ASA, 2022)
- Code ICH - Call to Action (AHA/Stroke 2024)
- Guidelines for Prevention of Stroke in Patients with Stroke and TIA (AHA/ASA 2021)
- Guidelines for adult stroke rehabilitation and recovery (AHA/ASA 2016)
- Guidelines for the management of patients with unruptured intracranial aneurysms (AHA/ASA, 2015)
- Guideline for the Management of Patients With Aneurysmal Subarachnoid Hemorrhage (AHA/ASA 2023)
- Guidelines for the Neurocritical Care Management of Aneurysmal Subarachnoid Hemorrhage (NCS 2023)
- Guidelines for the acute treatment of cerebral edema in neurocritical care patients (NCS 2020)
- Clinical practice guidelines for management of extracranial cerebrovascular disease (Society for Vascular Surgery 2022)
- The Society for Vascular Surgery practice guidelines on follow-up after vascular surgery arterial procedures (Society for Vascular Surgery, 2018)

Clinical practice guidelines for assessment, interventions, care and management for a stroke patient are published in the STROKE intranet site.



SBUH - ACUTE STROKE CODES: CODE BAT, CODE CSI

✓ Review PC0078 Code BAT Brain Attack Team for Acute Stroke Adult and Pediatric policy for more information

Code BAT (Brain Attack Team)

- called in the **inpatient units** for suspected stroke patients within 0-24 hours of last known well time
- called in the **ED** for suspected stroke patients with last known well time less than 6 hours AND Los Angeles Motor Scale (LAMS) + Speech Score less than 4
- **Code BAT-Pediatric**: is called for patients less than 18 years of age with last known well time within 0-24 hours.

Code CSI (Complex Stroke Intervention)

- called in the **inpatient units** by the Stroke Attending or designee to upgrade a Code BAT to a code CSI due to suspicion of a large vessel occlusion (LVO) or a bleed after imaging needing expeditious neurosurgical evaluation
- called in the **ED** for patients presenting within 0-24 hours of last known well time with LAMS + Speech score equal to or greater than 4, unknown last known well time, possible LVO on exam or if imaging showed vessel occlusion needing endovascular intervention, intracerebral hemorrhage or subarachnoid hemorrhage needing neurosurgical evaluation/intervention

Imaging orders:

- ❑ **"CODE BAT BAT CT Head w/o Contrast"** is ordered STAT to rule-out ICH
- ❑ **"CODE BAT CT Angio Head/ Neck W IV Con with Perfusion"** is ordered to evaluate vessels and perfusion mismatch/penumbra

SBUH - ACUTE STROKE ACTIVATION

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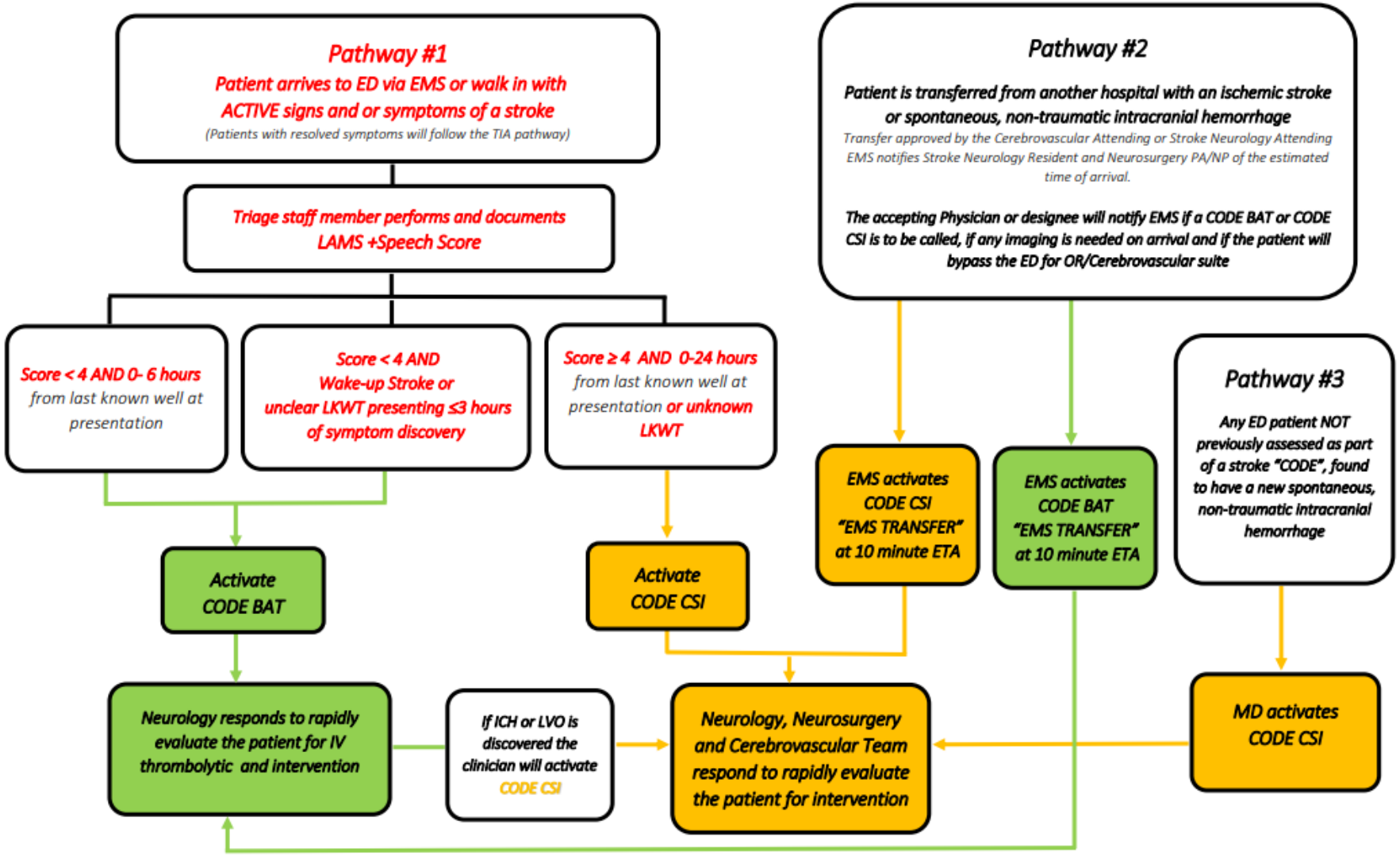
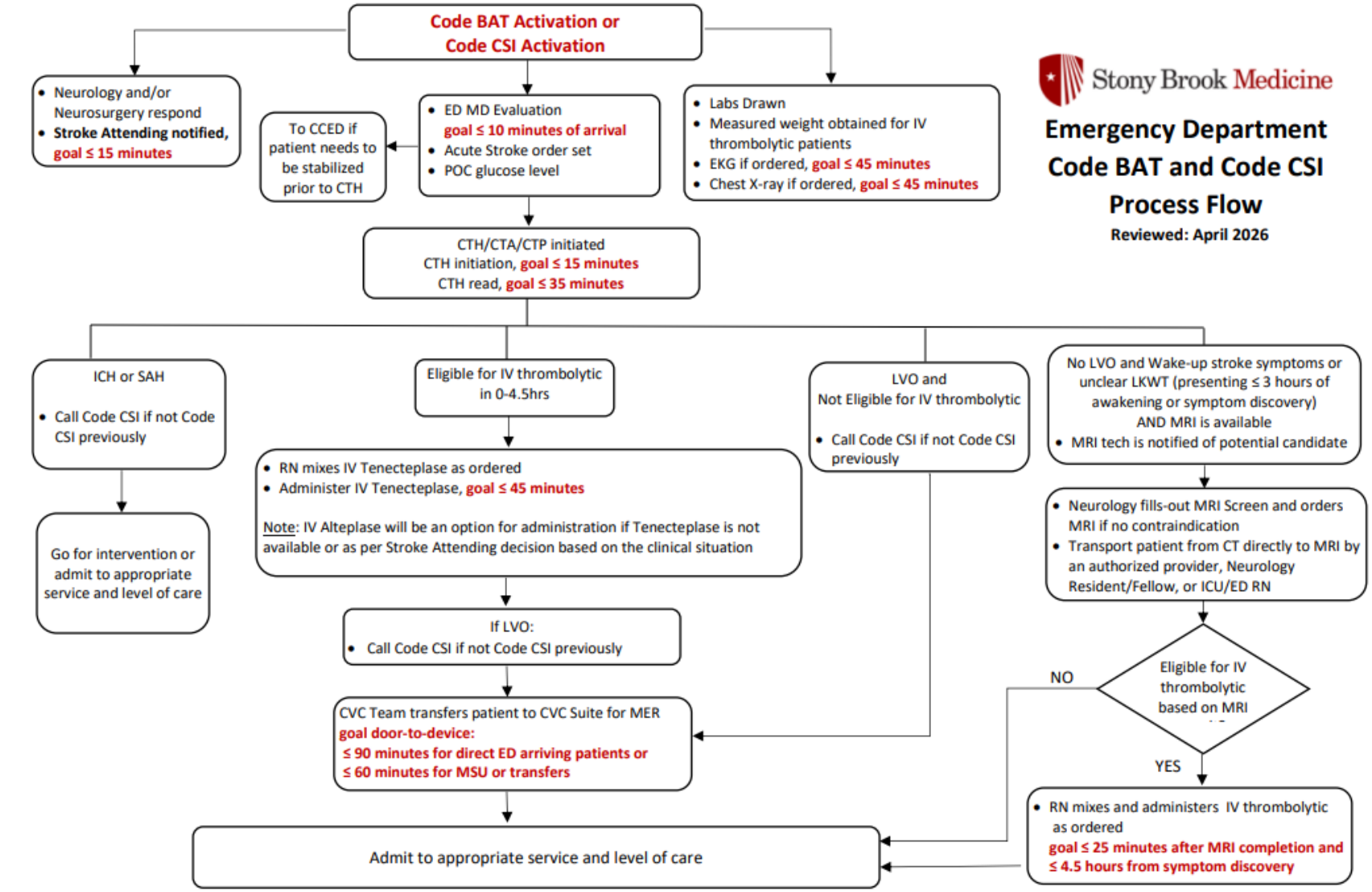
Emergency Department Acute Stroke Team Activations



Reviewed: April 2026

SBUH - ACUTE STROKE ACTIVATION – EMERGENCY DEPARTMENT



When more than one patient arrives at the same time and fulfill the Code BAT or Code CSI criteria:
The Stroke Attending (or his/her designee) in collaboration with the ED Attending Physician or Neurosurgery Attending are responsible for overseeing the decision-making process for prioritizing and expediting a rapid primary survey, evaluation, stabilization, management, and treatment for suspected acute stroke/TIA patients.

BAT- Brain Attack Team
CSI – Complex Stroke Intervention
MER – Mechanical Endovascular Reperfusion
LVO – Large Vessel Occlusion
Door-to-Device - arrival to first pass with thrombectomy device
MSU – Mobile Stroke Unit
LKWT- Last known well time

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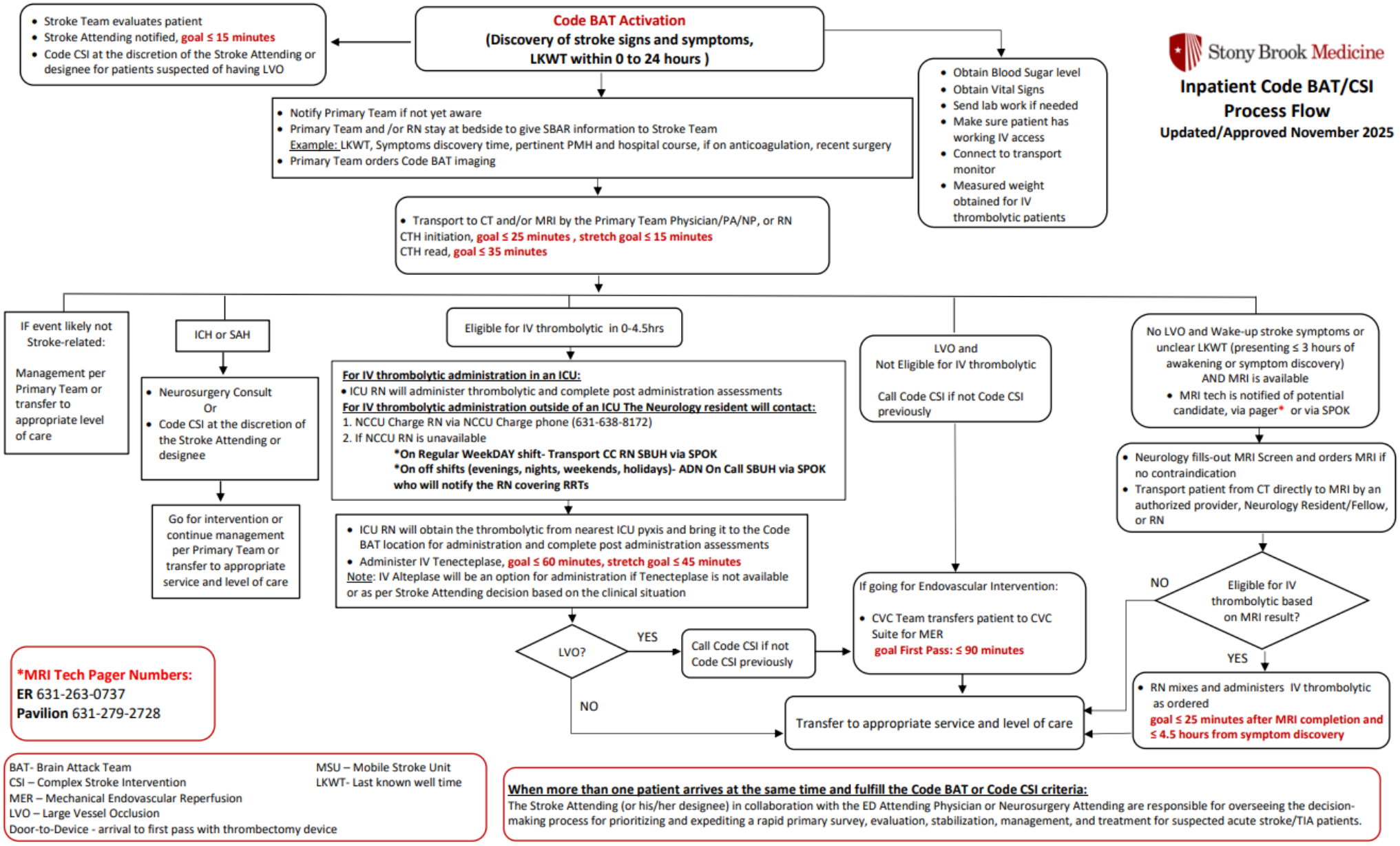
SBUH - ACUTE STROKE ACTIVATION – INPATIENT UNITS



SBUH - ACUTE STROKE ACTIVATION – INPATIENT UNITS

To help expedite inpatient Code BAT/CSI process:

- Primary Team Physician/NP/PA and/or Primary RN to stay at bedside to give SBAR to Stroke Team
  Ex: Pertinent PMH/hospital course, stroke symptoms, last known well time, symptoms discovery time, if patient is on anticoagulation, if recent surgery, pertinent lab result
- Obtain blood sugar level to rule-out hypoglycemia
- Make sure a working IV is in place, 2 IVs preferable
- Primary Team to order:
  "**CODE BAT CT Head w/o Contrast**" STAT to rule-out ICH.
  "**CODE BAT CT Angio Head/ Neck with IV CON with Perfusion"** to evaluate vessels and perfusion.
- Connect patient to a portable cardiac monitor for transport, have oxygen available if needed
- **Patient is transported to CT Scan by the Primary Team Physician/NP/PA.**
  - To avoid delays in the event the Primary Team is not available, the patient may be transported to CT by an authorized provider or an RN.
- Notify CT staff if patient is en route to CT, if Code BAT is being cancelled or if there is delay in transporting patient

For IV thrombolytic:

- Call the **NCCU charge nurse** if IV thrombolytic is needed for an **inpatient Code BAT/CSI in the MedSurg or ICR units**
- **IV thrombolytics are available in the ICU Pyxis and all ICU RNs have competency to administer IV thrombolytics**
- Collaborate with ADN if patient needs transfer to another service or higher level of care
- The ED may be contacted if additional assistance is needed for IV thrombolytic administration

Note: Measured weight is needed for IV thrombolytic dosing

SBUH - STROKE SUPPORT GROUPS

Receive encouragement, feedback and inspiration. Gain knowledge. Learn about helpful programs and resources. Open to all stroke survivors, family members and caregivers.

Stroke Caregiver Support Group - Meets the second Tuesday of every month, 7pm-8pm
Stroke Survivor Support Group - Meets the last Tuesday of every Month, 7pm-8pm

For more information, contact:
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Thank you for all you do everyday for our stroke patients.

For questions, contact:

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