**Title:** CODE STROKE - Emergent Evaluation of Patient Exhibiting Acute Stroke Symptoms in the Emergency Department

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**SCOPE**  
Any department staff identifying patients with Stroke Symptoms.

**RELATED POLICIES/PROCEDURES**  
PCD 47.007 CODE STROKE Emergent Evaluation of Patient INHOUSE Exhibiting Acute Stroke Symptoms  
DD EMS Lab Draws 10.3460  
PCD #11.007 Dysphagia Screening

**DEFINITIONS**  
None

**PURPOSE**  
A. To provide a timely systematic response to patients exhibiting stroke symptoms within 24 hours of last known well time (LKW).  
B. Prevent delays in an acute stroke emergency to provide early intervention and timely thrombolysis when indicated.

**POLICY**  
A. CODE STROKE team will be activated for patients who arrive to the ED with stroke symptoms **within 24 hours of last known well** (LKW) time by dialing 3-4444.  
B. If the patient is F.A.S.T. positive, the operator will page the code stroke team to the scene by a group beeper page and an overhead announcement CODE STROKE  
C. See Section III of this PCD for code stroke team roles and responsibilities.  
D. **CODE STROKE team activation:**  
1. CODE STROKE team will be activated based upon F.A.S.T. assessment criteria.  
2. If the patient experiencing stroke symptoms while at Eastern Maine Medical Center is an outpatient, they will be stabilized in the area where the code occurred, transported directly to CT and transferred to the ED for continued care.  
3. If they are a visitor, they will be sent to the emergency department for triage and activation of CODE STROKE by ED process  
4. If a patient is coming to ED via EMS with signs and symptoms of acute stroke, EMS will pre notify with the EMMC emergency department personnel to activate a CODE STROKE.
(1) The page will include estimated time of arrival (ETA).
(2) Direct to CT at the discretion of the ED physician. See attachment.

E. CODE STROKE Team Activation Criteria:
1. A CODE STROKE may be called if the patient is F.A. S.T. positive. Facial droop, Arm weakness, difficulty speaking, (any ONE of those symptoms) and Time – must be within 24 hours of last seen well or the last time the patient was seen without that neurological deficit. The call is activated by calling 34444. If patient is not F.A.S.T. positive, do not call a code stroke, call the patients provider. The F.A.S.T. protocol may be overridden by a physician or a charge nurse if it is felt the patient is having other symptoms of stroke such as leg weakness, ataxia and vision loss.

PROCEDURE
1) CODE STROKE Team Activation procedure
   i) ED Triage RN (or RN identifying initial stroke symptoms):
      (1) Assess patients for symptoms of stroke (F.A.S.T. assessment)
      (2) Determine the last time the patient was seen normal or at baseline and document.
      (3) Notify ED physician immediately.
      (4) If the patient is F.A.S.T. positive, initiate CODE STROKE by dialing 3-4444.
      (5) If patient has ETA, a pitstop will be performed at the triage desk so the ED physician can determine if this patient is stable to go direct to CT. (See attachment A.)
      (6) Initiate ED Stroke Symptoms Acute Joint Practice Protocol or ED physician may initiate ED Code Stroke orderset. (or delegate this task to the primary RN). Must include signs and symptoms and last seen well in CT order.
      (7) Move patient to critical care side or direct to CT if prenotified and cleared by ED physician, as soon as possible.
   ii) ED Primary RN:
      (1) Enter/verify entry of ED Stroke Symptoms Acute JPP.
      (2) Obtain actual weight and update dosing weight in EMR if needed.
      (3) Obtain patient vital signs and blood sugar.
      (4) If patient arrives with labs drawn by EMS, match blue wristband number to blue labels on specimen tubes. Then label tubes with ED lab labels per specimen labeling policy (ED DD 10.2430).
      (5) Help expedite patient transport to CT scan (within 25 minutes of arrival).
      (6) Keep patient NPO until a nursing dysphagia screen can be performed.
      (7) Order bedside speech swallow evaluation if patient fails nursing dysphagia screen per protocol.
      (8) Perform assessments and interventions as ordered by the ED physician and/or neurologist for patient management to include every 15-minute vital signs and neuro checks per the ED JPP stroke orderset. If patient does not receive tPA but is still in the 6-hour window continue to perform neurological checks and vital signs every 15 minutes unless otherwise ordered. Notify neurologist and ED physician immediately if patient has new or worsening symptoms.
   iii) ED Physician:
      (1) Perform initial assessment of the patient within 15 minutes
      (2) Oversee care of the patient.
      (3) Complete National Institute of Health Stroke Scale (NIHSS) when able.
      (4) Consult with neurology.

2) tPA Process
   A. If Neurologist and/or ED physician have determined the CODE STROKE patient is a candidate for t-PA, next steps include
      i) Take patient’s blood pressure and report to neurologist.
ii) **Confirm actual weight in EMR.**

iii) Provider will initiate Stroke Ischemic (with tPA) Powerplan.

iv) ED RN or pharmacist will obtain tPA from Pyxis.

v) ED RN or pharmacist will reconstitute tPA

vi) Perform an independent 2 RN medication check to confirm dose (pharmacist may perform check in place of second RN).

vii) ED RN may dose and administer

viii) If during the bolus or infusion the patient develops severe headache, acute hypertension, nausea or vomiting, bleeding, worsening neurological status, swelling (angioedema) or any allergic reaction; STOP the infusion, notify neurologist, ED physician immediately and obtain a head CT stat.

ix) Notify bed management for placement of patient in critical care unit

x) The completion of lab tests, ECG, and chest x ray should not delay the administration of IV thrombolytics.

xi) Physician documentation will indicate the reason eligible ischemic stroke patients did not receive IV thrombolytic therapy or if indicated, the reason why IV thrombolytic therapy was delayed past the 60 minute door to needle goal.

### B. Screen for emergent large vessel occlusion:

1. Physician or neurologist identifies patient with cortical signs of stroke or complete hemispheric syndrome.

2. If positive screen for any one of the above and patient within 24 hours of last known well physician or neurologist will:
   a. Order stat CTA of head and neck
   b. Activate emergent management of large vessel ischemic stroke protocol (CODE STROKE TIER 2) when EMMC endovascular interventionalist is on. EMMC operator will know schedule.
   c. If EMMC endovascular interventionalist is not on:
      i. Activate life flight service
      ii. Contact endovascular interventionalist at Maine Medical Center. 1-866-662-6632.
      iii. See attachment C.

3) **Code Stroke Tier 2 Procedure**

i) This process will be initiated for patients CTA or MRA confirmed large vessel occlusion within 24 hours of last seen well.

ii) Code stroke tier 2 can be activated by calling 34444. The operator will page code stroke tier 2 overhead and will notify the members of the team.

iii) Code stroke tier 2 can be activated by neurointerventionalist or the neurologist.

iv) Once paged the endovascular team will report to P2 within 30 minutes of being paged.

v) The endovascular team will call the resource nurse/charge nurse for the patient once the team is assembled.

vi) The patient will be escorted to the P2 suite for intervention, then to the ICU for post procedure care.

vii) The PACU may be used for post-operative recovery if the ICU bed is not immediately available.

viii) The code stroke tier 2 team will consist of
   1. The neurointerventionalist
   2. The anesthesiologist
   3. The resource nurse
(4) Transport
(5) Nursing supervisor
(6) Security
(7) ICU charge nurse
(8) Kevin Morgan
(9) Jen Modrey
(10) Radiology technicians per call schedule
(11) Interventional RN per call schedule

**Dosing Administration of Bolus:** *Follow steps on Alteplase Preparation Worksheet* Post-tPA Protocol: Utilize the Post-tPA Checklist located on the EMMC intranet homepage [http://intranet.emhs.org/EMMC/The-Hub/Post-tPA-Checks.aspx](http://intranet.emhs.org/EMMC/The-Hub/Post-tPA-Checks.aspx) In the event of a downtime, see tPA Administration Worksheet in downtime toolbox. Begin vital signs and neurological assessments from time of bolus administration. Every 15 minutes for 2 hours, then every 30 minutes for 6 hours, then every hour post t-PA for 16 hours and document in the electronic medical record (EMR). If patient comes to EMMC with t-PA infusing or administered prior to arrival: RN accepting patient will determine administration time of tPA, and continue vital signs and neurological assessments as outlined above.

4) **Code Stroke Roles and Responsibilities:**
The following staff will be notified of CODE STROKE team activation via group pager and overhead announcement indicating “CODE STROKE”.

Responsibilities of the Code Stroke team:

- **Neurologist**
  1. Respond to the bedside within 15 minutes within normal working hours Monday-Friday 0800-1700.
  2. After 1700 until 0800 Monday through Friday and weekends/hospital holidays, the neurologist on call will respond by phone within 15 minutes and 30 minute bedside response time per physician’s request.
  3. Complete National Institute of Health Stroke Scale (NIHSS).
  5. Verbally review the risk and benefits of iv alteplase with patient and family members as available. If no family members available 2 physician consent is appropriate. Consider CTA head and neck to rule out large vessel occlusion (CODE STROKE TIER 2).
  6. Discuss the case with the neurointerventionalist, assist in decision making for endovascular intervention.
  7. Perform standard post alteplase and/or post procedure follow up care as appropriate.
  8. Communicate plans of care with EMIC or ED physician as appropriate.

- **House Resource RN/Critical Care RN**
  1. Respond to patient bedside for CODE STROKE.
  2. Notify ICU charge if unable to respond to bedside and notify ED charge nurse who will be responding.
  3. Assist with patient transport to CT as needed.
  4. Assist with patient care as needed.
  5. Assist with code stroke tier 2 as needed.

- **Nursing Supervisor or designee**
  1. Respond to bedside for CODE STROKE.
2. Begin patient placement process if needed.

- **CT Scan Technologist**
  1. Clear CT scanner for incoming stroke patient if ETA less than 20 minutes and perform exam as ordered.
  2. Notify Radiologist when exam is complete.
  3. Ensure CXR has been completed prior to return to ED

- **Radiologist**
  1. Call ordering physician with the preliminary positive or negative reading of CT brain, CTA head/neck and MRI as soon as possible.

- **Pharmacy**
  1. Will remain on alert in the event they are needed to assist with tPA reconstitution or verification of tPA dose calculation.
  2. Will respond to the bedside when able.
  3. Will mix iv alteplase at the bedside
  4. Will verify patient weight and dose of iv alteplase
     a. Can provide the second check of the medication and dosing if a second nurse is not present

- **Phlebotomy Staff**
  1. Respond to the bedside for CODE STROKE team activation to draw labs per stroke orders.
  2. The following staff are paged when there is a CODE STROKE for notification purposes only and are not required to respond to the bedside:
     a. Nurse Coordinator for Stroke Program
     b. Nurse Manager Grant 5 Ortho/Neuro
     c. Clinical Educator Grant 5 Ortho/Neuro
     d. EMMC Stroke Medical Director

- **MRI technician**
  1. Will now receive the code stroke page and remain on alert in the event an urgent MRI brain needs to be completed to establish the core infarct
  2. Perform a rapid short sequence stroke protocol
  3. Alert radiologist as soon as exam is complete

- **Neurointerventional surgeon**
  1. Will be on alert for potential code stroke tier 2 (emergent large vessel strokes)
  2. Will respond to a page within 20 minutes
  3. Will review CTA, MRA or other advance vessel imaging and discuss the role of intervention with the treating neurologist
  4. Will activate the code stroke tier 2 team
  5. Will discuss with family members the endovascular procedure and obtain consent for care. If no family member available, the physician may do 2 physician consent as this is an emergency and the standard of care for large vessel occlusive stroke.
  6. Perform neuro-endovascular procedure as appropriate.
  7. Perform post-operative follow up care.

5) **Time Parameters**
   i) A CT of the head will be completed within 25 minutes of patient presentation of stroke symptoms.
ii) Interpretation of a head CT by a physician will be completed within 20 minutes and documented.

iii) Laboratory tests, electrocardiogram, and chest x-ray will be completed within 45 minutes of patient presentation with stroke symptoms, if ordered by the physician.

iv) NIHSS is used for the initial assessment of patients with acute stroke.

v) Brain imaging (MRI, MRA, CTA) scans are interpreted within 60 minutes of completion, if these tests are to be completed as soon as possible.

vi) Door to IV thrombolytic goal is as soon as possible and within 60 minutes of patient’s arrival to emergency department with acute stroke symptoms.

vii) Door to groin puncture will be 60 minutes for code stroke tier 2.

Possible Stroke interventions based on time last known well.

i) See attached flow sheet.

ii) For eligible patients within 3 hours or 4.5 hours of last seen well, IV alteplase and endovascular interventions based on clinical indications.

iii) For eligible patients within 6 hours of last seen well, endovascular intervention will be offered as appropriate. These patients will not need advanced imaging of the penumbra prior to intervention.

iv) For patients with unknown time last seen well or within the 6-24 hours window and a large vessel occlusive stroke, eligibility for thrombectomy will be determined based on DAWN and DEFUSE 3 criteria. Eligible patients will be offered intervention based on either CT perfusion with rapid or MRI DWI imaging of the core infarct.

1) DAWN eligibility criteria: Clinical imaging mismatch (CIM) defined by age, core, and NIHSS.
   a. ≥80 y/o and NIHSS ≥10 + core <21cc
   b. <80 y/o and NIHSS ≥10 + core <31cc or NIHSS ≥20 + core <51cc

2) DEFUSE 3 eligibility criteria where MRA / CTA reveals M1 segment MCA occlusion, or ICA occlusion (cervical or intracranial; with or without tandem MCA lesions AND Target Mismatch Profile on CT perfusion or MRI (RAPID):
   a. Ischemic core volume < 70 mL and
   b. Mismatch ratio > 1.8 and Mismatch volume ≥ 15 mL

REFERENCES
- The Joint Commission Disease Specific Care Certification Manual July 2014
- AHA/ASA focused update of the 2013 guidelines for early management of patients with acute ischemic stroke regarding endovascular treatment 2015.
- Continuum, evaluation and management of acute ischemic stroke, 2014.

ATTACHMENTS
A- In-House Code Stroke Protocol
B- Code Stroke Tier 2 Process
C- ALL CODE STROKE Patients: NIHSS and CT head within 24 hours of LSW

This document was approved by the committee(s) noted below on the date(s) as noted:
Provision of Care Committee, 11/14/2017
In-House Code Stroke Protocol
January 4, 2017

Answer Code Phone “What Code, and Location”

If this is a Code Stroke you will need to **obtain** the room number and patient’s name to enter into the group page.

*(Do NOT Overhead Page this information)*

OVERHEAD PAGE

Press CTRL F7 – Emergency Overhead Announcement and say

"Attention Please Code Stroke and location (Nursing floor or dept)"

3 times (2 times 11p-7a)

The hospital operator will send a group page to the STROKE TEAM (INPATIENT) using XTEND

The message will say “Code Stroke, Room Number, & patient’s last name”

The operator will page the Neurologist on-call with the following message

“Call EMMC Operator 973-7000 concerning Code Stroke”

When the Neurologist calls, the operator will connect the physician to a staff member in the stroke patients room.

**If there is no call back within 2 minutes, please re-page until call is returned**

0800-1800

Look up the patient on the EMIC list. Contact the assigned EMIC physician notify them of the stroke alert, patients name and room number.

**If the patient is not on the EMIC list contact the EMIC RRT physician.
Notify them of the Code Stroke, patients name and room number.**

1800-0800

Contact the EMIC RRT physician on the CROSS PHONE notify them of the stroke alert, patients name and room number.
ATTACHMENT B

CODE STROKE TIER 2 Process

ED or INHOUSE CODE STROKE

If Dr. Singer is not on for EMMC endovascular services, call the endovascular interventionalist at Maine Medical Center 1-866-662-6632

Suspected LVO Get CTA head and neck

ED physician or Neurologist will Call Operator asking for endovascular interventionalist on call.

YES endovascular candidate for EMMC

Dr Singer will activate his team = CODE STROKE TIER 2

Neurologist or ED physician will place order for ‘SP EMBOLIZATION’ And Post IV tPA powerplan if appropriate

This will be an EMIC admission and patient will go to the ICU post op

Outside Facility Code Stroke. Neurologist or Dr. Singer have already spoken with OSF

Transfer Center CODE STROKE:

Requesting provider needs to speak to ED doc of the day before transfer

CODE STROKE called when patient arrives to EMMC ED even if they already received tPA

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Printed copies are for reference ONLY. Please refer to the electronic copy for the latest version.
ALL CODE STROKE Patients: NIHSS and CT head within 24 hours of LSW

- 0-3 h
  - NIHSS <25
  - IV rtPA 0.9 mg/kg
- 3-4.5 h
  - NIHSS <25
  - Stat CTA Head and Neck
- 4-6 h
  - Stat CTA Head and Neck
  - + CTA for Large vessel occlusion AND MRI Mismatch
  - Open large vessels
  - ICU and Standard Stroke Care
  - Endovascular and ICU care

6-24 hours
- DAWN/DEFUSE