Santa Clara Valley Medical Center
Emergency Department Stroke Alert and Extended Stroke Alert Protocol
Assessment and Management of Potential Intravenous Thrombolysis with Alteplase and/or Neuro-endovascular Treatment Candidate

PURPOSE:

To describe the responsibilities of the Emergency Department (ED) physicians, ED Physician Assistants (PAs), ED nurses, ED medical unit clerks (MUCs), hospital Operators, Neurologists, Radiologists and ancillary staff during "Stroke Alert" and "Extended Stroke Alert" in the ED at Santa Clara Valley Medical Center (SCVMC).

BACKGROUND:

"Stroke Alert" is the announcement within the ED and hospital-wide that a patient with a possible acute ischemic stroke, who may be a candidate for intravenous (IV) thrombolysis and/or neuro-endovascular treatment, is en route to the ED by Emergency Medical Services (EMS) or has arrived at the ED triage or has been identified within the ED. Intravenous (IV) thrombolysis with Alteplase is a therapeutic intervention that may benefit selected patients with acute ischemic stroke when administered within 4.5 hours of the time of Last Seen Normal (LSN).

"Extended Stroke Alert" is the announcement within the ED and hospital-wide of a patient with a possible acute ischemic stroke with a "last seen normal" greater than 4.5 hours, less than 23 hours and NIHSS ≥ 6 who may be a candidate for neuro-endovascular treatment. Neuro-endovascular treatment is a therapeutic intervention that may benefit selected patients with acute ischemic stroke when initiated within 24 hours of Last Seen Normal.

The BEFAST is a screening tool for identifying patients with possible acute ischemic stroke. The acronym stands for: Balance-Eyes-Face-Arms-Speech-Time.

Stroke Alert and Extended Stroke Alert initiate a communication cascade that results in notification of the Neurology Junior Resident on-call, Neurology Senior Resident from 8am-5pm on weekdays, Neurology Attending on-call, Radiologist on-duty, Computed Tomography (CT) scan technologist, Intensive Care Unit (ICU) Resident on-duty, House Supervisor, the ED nurses and other ED staff, the Stroke Resource Nurse and the Stroke Coordinator.

A Radiology resident may serve as the designee for the Attending Radiologist.
A Neurology resident may serve as the designee for the Attending Neurologist.

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PROCEDURE:

1) ED nurses will use the BEFAST tool for the identification of patients with possible acute ischemic stroke at ED Triage and as needed elsewhere in the ED.

2) The ED MUC will be asked to call "Stroke Alert" or "Extended Stroke Alert" and identify the location. If Stroke Alert has been called by EMS, then the ED MUC will include the Estimated Time of Arrival (ETA).

3) The patient will be triaged as a Level 2, evaluated by MD and taken immediately to CT. If CT is unavailable, the patient will be placed in the Trauma Room (see pathway for EMS arrival for Stroke Alert[1]).

4) a) ED MUC will contact the hospital code operator (by dialing 133) and announce Stroke Alert or Extended Stroke Alert in the ED and provide the patient's location, room number/bed. If the Stroke Alert has been called by EMS, then the hospital Operator will include ETA.

   b) In addition, the hospital Operator will page the following providers to respond to the Stroke Alert/Extended Stroke Alert:
   8am-5pm M-F: Neurology Junior Resident on call, Neurology Senior Resident, Neurology Attending, Transport, ICU resident, CT technician, Radiologist on-duty, the Stroke Resource Nurse and the Stroke Program Coordinator.
   5pm-8am and weekends: Neurology Junior Resident on call, Neurology Attending, Transport, ICU resident, CT technician, Radiologist on-duty, the Stroke Resource Nurse and the Stroke Program Coordinator.

   i. SCVMC's hospital Operator will enter "811" to indicate that the call is regarding a Stroke Alert or Extended Stroke Alert and then 408-282-0535. The CT tech will perform study and contact appropriate radiologist for STAT interpretation.
   ii. The emergency notification system will pop up on computer screens throughout the hospital with a 'Stroke Alert or Extended Stroke Alert' announcement, patient location, date and time and ETA if applicable.

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5) The Neurology resident should be at the patient's bedside within 10 minutes during regular work days. The Neurology resident should always be available on the Stroke Line within 10 minutes of paging from Monday to Friday, 5pm to 8am and on weekends.

6) The Neurology Attending calls in the Stroke Line within 20 minutes of getting paged.

7) If the location includes an identified bed; The ED MD, the ED RN, and ED Tech assigned to that bed will respond.

8) Within 10 minutes of calling the Stroke Alert or Extended Stroke Alert, one of the following designated practitioners must respond to the patient's side: ED MD or ED PA, and ED RN.

9) The initial MD evaluation includes a preliminary assessment of exclusion/inclusion criteria for IV Alteplase, consideration for neuro-endovascular treatment, brief History and Physical (H&P) and neurological exam.

10) The ED MD joins the **Stroke Line by dialing 408-282-0535** to discuss case with Neurology Attending, Resident and Radiology.

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The Neurology Resident and Attending will follow the steps as outlined in:

Table 1: SCVMC EMERGENCY DEPARTMENT STROKE ALERT

	SCVMC EMERGENCY DEPARTMENT STROKE ALERT
	BEFAST (+) and LSN ≤ 4.5 hours or EMS ring down
1	ED calls STROKE ALERT
2	Neurology Junior Resident on-call, Neurology Senior Resident from 8am-5pm. Neurology Attending on-call, Radiologist on-duty, Computed Tomography (CT) scan technologist, Intensive Care Unit (ICU) Resident on-duty, House Supervisor, the ED nurses and other ED staff, the Stroke Resource Nurse and the Stroke Coordinator. Transport receive page: **"ED Stroke Alert, Location, Room/Bed, ETA if applicable"**
3	Neurology Attending, Neurology Resident, Radiologist receive 2nd page: MRN: xxxx (if available) and **Stroke Line number (408) 282-0535**
4	**Working hours:** Bedside evaluation by Neurology Resident within 10 minutes.
	After hours: Neurology Resident calls **Stroke Line (408) 282- 0535** to join conference call within 10 minutes.
5	In the meanwhile, ED MD assesses patient, head CT is performed, ED MD and Neurology MD discuss performing a CTA Head and neck while stroke labs are being processed
6	ED Attending calls in to Stroke Line with LSN, NIHSS, contraindications
7	If patient is likely a t-PA candidate, request to have t-PA premixed and HELD
8	Radiology Resident calls in to Stroke Line with CTH/CTA result or notifies the ED Attending directly
9	Neuro Attending calls in to Stroke Line for discussion and tPA decision within 20 minutes
10	ICU Resident and House Supervisor get paged for disposition
11	Neurology Resident drives in to assess patient while t-PA is infusing
12	If transfer to Comprehensive Stroke Center is required, contact Stanford Transfer Center 650-723-4696. Request from Radiology to transmit the images to Stanford through Life Image.

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Table 2: SCVMC EMERGENCY DEPARTMENT EXTENDED STROKE ALERT

	SCVMC EMERGENCY DEPARTMENT EXTENDED STROKE ALERT
	NIHSS ≥ 6 and LSN 4.5 hours to 23 hours or EMS ring down
1	ED calls EXTENDED STROKE ALERT
2	Neurology Junior Resident on-call, Neurology Senior Resident from 8am-5pm. Neurology Attending on-call, Radiologist on-duty, Computed Tomography (CT) scan technologist, Intensive Care Unit (ICU) Resident on-duty, House Supervisor, the ED nurses and other ED staff, the Stroke Resource Nurse and the Stroke Coordinator. Transport receive page: **"ED Extended Stroke Alert, Location, Room/Bed, ETA if applicable"**
3	Neurology Attending, Neurology Resident, Radiologist receive 2nd page: MRN: xxxx (if available) and **Stroke Line number (408)282-0535**
4	**Working hours:** Bedside evaluation by Neurology Resident within 10 minutes.
	After hours: Neurology Resident dials **Stroke Line (408)282-0535** to join conference call within 10 minutes
5	In the meanwhile, ED MD assesses patient, head CT is performed, ED MD and Neurology MD discuss performing a CTA head and neck, stroke labs are being processed
6	ED Attending calls in to Stroke Line with LKW, NIHSS, potential contraindications
7	Radiology Resident calls in to Stroke Line with CTH/CTA result
8	Neuro Attending calls in to Stroke Line for discussion and decision within 20 minutes
9	ICU Resident and House Supervisor get paged for disposition
10	If transfer to Comprehensive Stroke Center is required, contact Stanford Transfer Center 650-723-4696. Request from Radiology to transmit the images to Stanford through Life Image.

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11) The **ED nurse** will perform the following:
    a) Perform a point of care (POC) Glucose Test
    b) Weigh patient with bed scale.
    c) STAT non-contrast Head CT to be initiated within 20 minutes of patient arriving for Stroke Alert/Extended Stroke Alert
    d) Collect and Send the DIRE specimens to the lab by:
        i. Pneumatic Tube System by dialing "99" station and entering Code: 1234
        ii. Designate a person to hand carry specimens to the lab (pass directly to one of the laboratory personnel and announce that your delivery includes a DIRE request)

        DIRE: PT/INR, PTT, CBC, Platelets, Glucose, Creatinine and in appropriate circumstances, b- HCG. Results should be available within 35 minutes of patient's arrival.
        STAT: Panel 7, Troponin and Type & Screen.
    e) RN will perform a NIH Stroke Scale score within 15 minutes of calling a Stroke Alert or Extended Stroke Alert and document it.
    f) If the Head CT is negative for bleeding and a Large Vessel Occlusion is suspected, then the patient will undergo head CT Angiography before leaving the CT suite. Initiation of IV Alteplase while patient is still in the CT suite if possible and blood pressure is in acceptable range (systolic <185 and diastolic <110).
    g) Place two saline locks in peripheral veins.
    h) Obtain blood pressure with a manual cuff prior to administration of IV Alteplase. The systolic blood pressure should be less than 185. The diastolic blood pressure should be less than 110.
    i) Obtain written order from the physician in the Electronic Health Record (EHR) prior to the administration of the intravenous thrombolysis with Alteplase.
    j) Give intravenous (IV) thrombolysis with Alteplase to the patient.
    k) Perform blood pressure measurements with a manual blood pressure cuff and bleeding assessments thrombolytic adverse reaction assessment every 15 minutes for the first two hours, every 30 minutes for the next six hours, and then every hour for the next 16 hours after IV Alteplase is administered for ischemic stroke. (The systolic blood pressure should be less than 180. The diastolic blood pressure should be less than 105.)

l) Assess for orolingual angioedema every 15 minutes for the first two hours.
m) Ensure EKG and portable chest x-ray (CXR), if ordered, to be completed within 45 minutes of patient arrival.
n) Ensures that IV Alteplase that is opened but not used is returned to the pharmacy. For unused IV alteplase reimbursement, pharmacy will need spoilage or destruction form filled out and faxed.
o) Designate that the patient is to be NPO until stroke dysphagia screen has been performed.

12) **On call Radiologist**[2] will interpret the non-contrast Stat head CT results within 15 minutes of completion of the study.
The Radiologist will call the Stroke Line 408-282-0535 or ED attending directly to report the preliminary result.
The Radiologist will provide STAT interpretation of CT angiogram of the head to ED physician and neurologist within 30 minutes after the order is placed.

13) If the patient remains a candidate for IV Alteplase after the Stat Head CT, the ED Physician or the Neurology Representative, will discuss treatment options with the patient and/or family.

14) If the patient is to be treated with Alteplase in the 3 to 4.5 hours window, the expectation is that the **Neurology Representative or the ED Physician** will obtain a written informed consent.

15) IV Alteplase will be given according to the detailed protocol within the electronic and/or written order sets, within 4.5 hours of LSN and at maximum within 45 minutes of patient's arrival. Administration of Alteplase should not be delayed for CTA head and neck.

16) The **ED MD** will transfer care to the **ICU physician** for patients requiring continued critical care, including patients receiving intravenous Alteplase administration.

17) Please refer to the Ischemic Stroke Protocol for further management and disposition for non-IV Alteplase recipients.

18) Follow down time procedures[3] if needed.

[1] ED Stroke Arrival Pathway

[2]Radiology—during regular hours, CT is to be read by the most qualified readily available radiologist; during off hours, CT to be read by on-call radiology resident with the option to consult radiology attending.

[3]A "Stroke" downtime packet is to be readily accessible in the ED Stroke Bag. Additional packets are available in the Nursing Office. The packet contains the following:

- Physician Order Form
- Stroke Assessment Packet (NIHSS)
- Neurological Observation Flowchart
- NIH Stroke Scale
- Diagnostic Imaging Order Forms
- Nurses Bedside Notes
- Dysphagia Screen 2017
- Graphic Sheet PCU/Neuro Patient Care
- Stroke Alert Nurses Notes
- Intensive Care flowsheet
- Order Sets: are NOT included. Physicians needs to print them out of Health Link, to ensure that they are current.

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Approved by:

DocuSigned by:
Dr. Jeffery Leinen
F0A82C4EC1D5498...

4/11/2019

Jeffrey Leinen, MD — Date
Chairman, Department of Emergency Medicine

DocuSigned by:
Jennifer Tong
0ACD62698CD64B9...

4/15/2019

Jennifer Tong, MD — Date
Medical Director of SCVMC

DocuSigned by:
Sanjay Kurani
2F1F0D18E5414EB...

4/15/2019

Sanjay Kurani, MD — Date
Interim Hospital Director

DocuSigned by:
Elisabeth A. Maillot M.D.
6519DF89126E4E0...

4/16/2019

Elisabeth Mailhot, MD — Date
Chairman, Department of Laboratory Services

DocuSigned by:
Christoph Karch
2302A28FEF5B4C5...

4/11/2019

Christoph Karch, MD — Date
Director of Stroke Program

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DocuSigned by: Benjamin Chou — 4/17/2019
EF6F16275DD1401...

Benjamin Chou, MD — Date
Chairman, Department of Radiology

DocuSigned by: Andrea Brollini — 4/11/2019
9D859782E67E473...

Andrea Brollini, RN, MSN — Date
Director, Nursing, Critical Care and Administrative Services

DocuSigned by: Tina Thibeau — 4/11/2019
AC5B58F96B3B4E7...

Tina Thibeau-Boyd, RN, BSN — Date
Nurse Manager, Emergency Dept./Express Care Clinic

DocuSigned by: Cynthia Stewart — 4/11/2019

Cynthia Stewart BSN, RN, CPHQ — Date
Quality Improvement Manager

DocuSigned by: Dianne Tiernan — 4/11/2019

Dianne Tiernan, BSRT CRT (R)(M) — Date
Director of Diagnostic Imaging

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