NEUROSCIENCES

HC.STK.100.GD

APPROVED JUNE 2018

Practice Guidelines

Acute Stroke Practice Guidelines for the Emergency Department

INCLUDES ISCHEMIC STROKE, TIAs, INTRACEREBRAL HEMORRHAGE, AND NON-TRAUMATIC SUBARACHNOID HEMORRHAGE

Policy statement

OHSU Healthcare has adopted theses practice guidelines in order to delineate a consistent, evidence-based approach to treating the patient who presents with signs and symptoms consistent with acute stroke. Although these guidelines assist in guiding care, responsibility to determine appropriate care for each individual remains with provider themselves.

OUTCOMES / GOALS	1. Rapid identification of vascular events. 2. Manage appropriately and efficiently according to Brain Attack Coalition guidelines. 3. Evaluate in a cost-effective manner.
TRIAGE STAFF	1. Triage nurse to see patient rapidly upon arrival. If presenting with stroke signs/symptoms less than 24 hours from onset, notify ED provider. (Stoke symptoms include: Sudden onset of numbness or weakness of the face, arm or leg, especially on one side of the body; confusion, trouble speaking or understanding speech; trouble seeing in one or both eyes; trouble walking, dizziness, or loss of balance or coordination; severe headache with no known cause or "worst headache of my life.") Anticipate ED provider initial evaluation to be completed within 10 minutes of patient arrival; if stroke suspected, they will activate Stroke Alert via Emergency Communication Center (ECC). 2. If onset of symptoms is greater than 24 hours or symptoms have resolved and ABC's are stable, then triage level may be ESI Level 3. May upgrade the triage level based on nursing judgement. 3. Registration to be done at bedside.
E.D. REGISTRATION	Prioritize for immediate bedside registration.
R.N.	1. Notify CT to anticipate an emergent CT scan and enter order as Extreme Emergency if symptoms are persistent and onset is less than 24 hours. 2. Obtain Point of Care (POC) glucose, unless EMS glucose value already known. 3. Anticipate orders for: a. CT without contrast b. Labs for CBC, INR, PTT, to be sent in red Stroke Alert bag c. Labs for POC troponin and POC Chem 8 to be run in the ED d. 12 lead EKG e. CXR (if clinically indicated)

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E.D. PHYSICIAN	1. If symptoms onset is less than 24 hours, evaluate for suspected acute stroke within 10 minutes of patient arrival, if stroke suspected, activate Stroke Alert via the ECC and initiate orders for CT without contrast, CBC, INR, PTT,to be sent in Stroke Alert bag; POC troponin, POC Chem 8, and 12 lead EKG. Obtain CXR if clinically indicated. 2. History: age, time of symptom onset (when last normal), duration, type of symptoms, medications (antiplatelet and anti-coagulants), past medical history (CAD, HTN, DM, previous TIA/stroke, PVD, seizures/epilepsy, tobacco, illicit drug use. 3. Exam: visual fields, extraocular muscles, speech impairment, weakness or sensory deficits, incoordination, ataxia.
E.D. AND STROKE TEAM PHYSICIAN	1. Actions based on duration of symptoms: a. For persistent symptoms onset less than 24 hours: i. Stroke Team to respond via phone to Stroke Alert page within 5 minutes and discusses case with ED provider. If patient determined to be a potential treatment candidate with thrombolytics and /or thrombectomy, the rapid acute stroke workup with continue as outlined in #2 below, and the Stroke Team will arrive in the department within 30 minutes, along with a clinical stroke coordinator, to evaluate patient for further treatment. If not a treatment candidate, the Stroke Alert will be considered a Stand Down and appropriate workup will continue in a timely manner. ii. Consider thrombolytics for all ischemic stroke patients who present with symptom onset of 3 hours or less. Select patients may be considered for thrombolytics between 3-4.5 hours of onset. Follow OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke as appropriate with goal of door to thrombolytics less than 60 minutes. iii. Consider interventional radiology maneuvers for onset of symptoms of 24 hours or less. iv. Other research options may be available for patients with onset of symptoms of 24 hours or less and initiated by the Stroke Team Physician. b. For potential acute treatment candidates: i. Head CT to be completed within 20 minutes of arrival and film reviewed by radiology (or Stroke Team Physician) within 20 minutes of completion. Order “CT without contrast” and ordered “extreme emergent.” i. Labs, if indicated: CBC, INR, PTT, POC troponin, and POC Chem 8 (must be completed and results available in Epic within 45 minutes of arrival). i. 12 lead EKG (must be completed and results ready for review within 45 minutes of arrival, prioritize CT over 12 lead). i. CXR, if clinically indicated (must be completed and results ready for review within 45 minutes of arrival, prioritize CT over CXR). 2. If CT subsequently shows intracranial hemorrhage (subarachnoid or intracerebral), request immediate neurosurgery consult and reverse any anti-coagulants. Refer to OHSU Practice Guidelines for the Inpatient Management of Patients with Intracerebral and Subarachnoid Hemorrhage. 3. For ischemic stroke or TIA with persistent symptom onset of greater than 12 hours, but less than 24 hours, have the ECC (Emergency Communication Center) contact the Stroke Team (pager 12600). Complete the items in #2 above in a timely manner, unless advised otherwise by the Stroke Team. 4. If symptom onset is greater than 24 hours, obtain CBC with diff, INR, PTT, BMS and call the neurology resident on call who will determine additional diagnostics that may be required. 5. If symptoms have resolved or are transient (TIA), see evaluation of TIA section below.

E.D. NURSE	1. Interventions to be initiated upon arrival a. History: i. Age, time of symptom onset (when last normal), duration, present or improving. ii. History: coronary artery disease, coagulapathy, cardiac dysrhythmias, previous TIA/ stroke, diabetes mellitus, seizure/epilepsy. iii. Medications/Allergies iv. Facilitate access to patient by bedside registrar. b. Assessment: i. Obtain full set of vital signs, including focused neuro check. ii. Repeat every 15 minutes until patient condition stabilizes. iii. Attach cardiac monitor and assess need for supplemental oxygen. iv. Initiate 18G IV (will need 2 18G IV if a thrombolysis or angio candidate), obtain blood, send immediately to lab CBC, INR, PTT, and complete POC troponin & Chem 8. [CBC, INR, PTT, and POC Chem 8 results must be available within 45 minutes of arrival.] In addition, draw and hold blood bank tubes. Initiate second IV after CT. v. Check fingerstick glucose (CBG) unless EMS glucose value is known. vi. Obtain 12 lead EKG within 45 minutes of arrival, and CXR, if clinically indicated (do not delay CT for EKG or CXR). vii. Initiate Social Services consult for family, if appropriate viii. No food, fluid, or medications by mouth until a dysphagia screening has been completed and documented (see Bedside Nurse Swallow Screen, Cog/Neuro section of ED RN Advanced Navigator.
C.N.A.	1. Assist ED nurse to undress patient into a hospital gown, perform vital signs, and EKG (do not delay CT for EKG). 2. Complete patient belongings list. 3. Run elevator for emergent stroke patients as needed. 4. Document output.
E.D. PHYSICIAN	1. Determine code intervention and review Advance Directives or POLST form, if present. 2. Initiate bed request for either NSICU or 10K based on admission criteria outlined below.

ADMISSION CRITERIA	1. Evaluation of probable TIA (deficit resolved): a. Admit to Observation Unit to complete evaluation as needed. b. Obtain CT without contrast, CBC with diff, INR, PTT, BMS, and 12 lead EKG if not already performed in acute. c. Bilateral duplexes of the carotid artery or CTA neck if symptoms consistent with anterior circulation and if not done within last 3 months. d. MRI/MRA or CT/CTA if symptoms consistent with posterior circulation event (more than one of the following: diplopia, dysarthria, central vertigo, or ataxia). Inform radiology of possible pathology involving vertebral-basilar circulation if clinically relevant. e. Nurse swallow screen to be completed prior to any PO intake (see Bedside Nurse Swallow Screen) Cog/Neuro section of ED RN Advanced Navigator. f. Fasting lipid levels in am. g. Focused neuro checks every 2 hours. h. Neurology consult on all cases of probable TIA. i. Symptoms still present or are recurrent. ii. Acute stroke within past month. iii. Carotid stenosis >50% on symptomatic side. (These patients to be considered for stent of CEA.) iv. MRI/MRA performed. v. These patients should have follow-up arranged in the Stroke Clinic (503-494-7225). 2. Criteria for admission to Neurosciences ICU: a. Post IV (intravenous) or IA (intra-arterial) thrombolytics or device thrombectomy. b. Patients with hemispheric stroke in whom impending mental status decline and loss of protective airway reflexes is of concern. c. Patients with basilar thrombosis or tip of the basilar syndrome. d. Patients with crescendo TIAs. e. Patient requiring blood pressure augmentation for a documented area of hypoperfusion. f. Patients requiring IV blood pressure or heart rate control. g. Patients requiring every 1-2 hour neurological evaluation depending on symptom fluctuation or if ongoing ischemia is suspected. h. Patients with worsening neurological status. i. Patients post interventional neuroradiology procedure. 3. Criteria for Admission to 10K: a. Acute stroke symptom onset > 24 hours and not meeting above criteria. b. Non-crescendo TIAs where workup not completed. c. Complete Epic Orders, NEU: Stroke/Rule Out Stroke/TIA: Admission. Note: Remote telemetry is available on 10K that is monitored by 11K.
DISCHARGE CRITERIA	1. Criteria for discharge to home: a. Completion of evaluation. b. No significant findings on the above workup. c. Complete resolution and no recurrent symptoms. d. Anti-platelet agents or resume anti-coagulation, if indicated. e. Consider starting on a cholesterol-reducing agent if elevated fasting lipid levels. f. Follow-up arranged in Stroke Clinic (503-494-7225). g. Patient education and discharge teaching completed and provided in writing to include: personal risk factors, warning signs for stroke, activation of EMS, need for follow-up after discharge, medications prescribed, tobacco cessation counseling if smoked anytime in past 12 months.

BLOOD PRESSURE MANAGEMENT	

1. Blood Pressure Management in Patients NOT eligible for thrombolytics:
    a. Systolic < 220 or diastolic < 120:
        i. Observe unless other end-organ involvement (e.g., aortic dissection, acute myocardial infarction, pulmonary edema, hypertensive encephalopathy).
        ii. Treat other symptoms of stroke (e.g., headache, pain, agitation, nausea, vomiting). Treat other acute complications of stroke, including hypoxia, increased ICP, seizures, or hypoglycemia.
    b. Systolic > 220 or diastolic 121-140:
        i. Labetalol 10-20 mg IV given over 1-2 minutes, or
        ii. Hydralazine 10-20 mg IV every 10 min, or
        iii. Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour.
        iv. Aim for a 10-15% reduction in BP.
2. Blood Pressure Management in Patients eligible for thrombolytics:
    a. Prethrombolytics:
        i. Systolic >185 or diastolic >110
        ii. Labetalol 10-20 mg IV given over 1-2 minutes. May repeat one time, or
        iii. Hydralazine 10-20 mg IV every 10 min, or
        iv. Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour. When desired blood pressure is attained, adjust as needed to maintain desired blood pressure.
    b. During/after thrombolytics:
        i. Starting from beginning of IV tPA infusion check blood pressure every 15 minutes for 2 hours, then every 30 minutes for 6 hours, and then every hour for 16 hours.
        ii. Systolic >180 or diastolic >105:
            a. Labetalol 10-20 mg IV given over 1-2 minutes, followed by Nicardipine drip, as needed. Or Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5-15 minutes to maximum of 15 mg/hour. When desired blood pressure is attained, adjust as needed to maintain desired blood pressure.

Bibliography

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Jauch, EC, et al. (2013). Guidelines for the Early Management of Patients with Acute Ischemic Stroke: A guideline for healthcare professionals from the AHA/ASA. Stroke, 44:870-947.

Sacco, RL, et al. (2013). An Updated Definition of Stroke for the 21st Century: A statement for healthcare professionals from the AHA/ASA; AHA/ASA Expert Consensus Document. Stroke, 44:2064-2089.

Powers, W.J., et al. (2018). 2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. Stroke, 2018; 49: e46-e110.

Related forms and procedures

OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke, HC.STK.101.GD
Dosing Information for t-PA administration in Acute Ischemic Stroke HC.STK.101A
OHSU Practice Standard for the Inpatient Management of Intracerebral Hemorrhage HC.STK.103.GD
OHSU Practice Standard for the Inpatient Management of Subarachnoid Hemorrhage HC.STK.104.GD
NPEOC - Adult Critical Care Standard of Care
NPEOC - Inpatient Adult Acute Care Adult
Bedside Swallow Screen Form
NEU: Stroke/Rule Out Stroke/TIA: Admission

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Neurosciences Best Practices Committee (2011, 2012, 2013, 2018)
Quality and Safety Committee