



**OHSU HEALTH CARE SYSTEM  
PRACTICE STANDARD**

**Acute Stroke Practice Standard for the Emergency Department**

(includes ischemic stroke, TIAs, intracerebral hemorrhage, and non-subarachnoid hemorrhage), **PS 01.11**

Last Reviewed Date: 2/2/10

**STATEMENT OF STANDARD**

OHSU Hospitals and Clinics have adopted this practice standard in order to delineate a consistent, evidenced-based approach to treating the patient who presents with signs and symptoms consistent with acute stroke. Although this standard assists in guiding care, responsibility to determine appropriate care for each individual remains with the provider themselves.

<b>Outcomes/Goals</b>	<ol style="list-style-type: none"> <li>1. Rapid identification of vascular events.</li> <li>2. Manage appropriately and efficiently according to Brain Attack Coalition guidelines.</li> <li>3. Evaluate in a cost-effective manner.</li> </ol>
<b>Triage Staff</b>	<ul style="list-style-type: none"> <li>• Document chief complaint: Sudden onset of numbness, weakness, difficulty speaking, vision changes, or incoordination that are present, improving, or have resolved.</li> <li>• Screen for suspected acute stroke using the "<a href="#">Cincinnati Prehospital Stroke Scale</a>"; one positive finding and onset of symptoms is 12 hours or less the patient triage level is ESI Level 1 or 2 per patient condition.</li> <li>• Move immediately to an acute room and notify ED physician, charge nurse, and HUC.</li> <li>• Consider calling Rapid Response Team if needed.</li> <li>• If onset of symptoms is greater than 12 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 judgment.</li> <li>• Registration to be done at bedside.</li> </ul>
<b>ED Registration</b>	Prioritize for immediate bedside registration.
<b>RN</b>	<p>Notify CT to anticipate an emergent CT scan and enter order as Extreme Emergency if symptoms are persistent and onset is less than 12 hours.</p> <p>Anticipate orders for</p> <ul style="list-style-type: none"> <li>• CT without contrast.</li> <li>• Labs for CBC, INR, PTT, BMS.</li> </ul>

	<ul style="list-style-type: none"> <li>• 12 lead EKG.</li> <li>• CXR (see Actions Based on Duration of Symptoms below).</li> </ul>
<b>ED Physician</b>	<ul style="list-style-type: none"> <li>• If symptom onset is less than 12 hours, evaluate for suspected acute stroke within 10 minutes of patient arrival, have the ECC (Emergency Communication Center) contact the Stroke Team (pager 12600) immediately, and initiate orders for “CT without contrast”; CBC, INR, PTT, and BMS. Obtain CXR, and 12 lead EKG, if clinically indicated.</li> <li>• History: age, time of symptom onset (when last normal), duration, type of symptoms, medications (antiplatelets and warfarin), past medical history (CAD, HTN, DM, previous TIA/stroke, PVD, seizures/epilepsy, tobacco, illicit drug use.</li> <li>• Exam: visual fields, extraocular muscles, speech impairment, weakness or sensory deficits, incoordination, ataxia.</li> </ul>
<b>ED and Stroke Team Physician</b>	<p><b>Actions based on duration of symptoms</b></p> <ol style="list-style-type: none"> <li>1. For persistent symptom onset less than 12 hours: <ol style="list-style-type: none"> <li>a. Head CT to be completed within 25 minutes of arrival and film reviewed by radiology (or Stroke Team Physician) within 20 minutes of completion. Order “CT without contrast.”</li> <li>b. Labs: CBC, INR, PTT, and BMS (must be completed and results available in EPIC within 45 minutes of arrival).</li> <li>c. 12 lead EKG and CXR, if clinically indicated (must be completed and results ready for review within 45 minutes of arrival).</li> <li>d. 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 <a href="#">OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke, PS01.12</a>, as appropriate.</li> <li>e. Consider interventional radiology maneuvers for onset of symptoms of 12 hours or less.</li> <li>f. Other research options may be available for patients with onset of symptoms of 24 hours or less and initiated by the Stroke Team Physician.</li> </ol> </li> <li>2. If CT subsequently shows intracranial hemorrhage (subarachnoid or intracerebral), request immediate neurosurgery consult and reverse any anti-coagulants. Refer to OHSU Practice Standard for the Inpatient Management of Patients with Intracerebral and Subarachnoid Hemorrhage.</li> <li>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 #1 (a-c) above in a timely manner, unless advised otherwise by the Stroke Team. The Stroke Team Physician will be in phone contact within 5 minutes to advise about recommended course of action. When appropriate, they will arrive in the department within 30 minutes, along with a clinical stroke coordinator, to evaluate patient for further treatment. (For more details about the Stroke Team, see Oregon Stroke Center documents.)</li> </ol>

	<ol style="list-style-type: none"> <li>4. If symptom onset is greater than 24 hours, obtain CBC, INR, PTT, BMS and call the neurology resident on call who will determine additional diagnostics that may be required.</li> <li>5. If symptoms have resolved or are transient (TIA), see evaluation of TIA section below.</li> </ol>
<b>ED Nurse</b>	<p><b>Interventions to be initiated upon arrival</b></p> <ul style="list-style-type: none"> <li>• History: <ol style="list-style-type: none"> <li>1. Age, time of symptom onset (when last normal), duration, present or improving.</li> <li>2. History: coronary artery disease, coagulopathy, cardiac dysrhythmias, previous TIA/stroke, diabetes mellitus, seizure/epilepsy</li> <li>3. Medications / Allergies</li> <li>4. Facilitate access to patient by bedside registrar.</li> </ol> </li> <li>• Assessment: <ol style="list-style-type: none"> <li>1. Obtain full set of vital signs, including focused neuro check.</li> <li>2. Repeat every 15 minutes until patient condition stabilizes.</li> </ol> </li> <li>• Attach cardiac monitor and assess need for supplemental oxygen.</li> <li>• Initiate 18G IV (will need 2 18G IV if a thrombolysis or angio candidate), obtain blood, and send immediately to lab. [Basic metabolic panel, CBC, INR, and PTT results must be available within 45 minutes of arrival.] In addition, draw and hold blood bank tubes. Initiate second IV after CT.</li> <li>• Check fingerstick glucose (CBG) unless EMS glucose value is known.</li> <li>• Obtain 12 lead EKG and CXR within 45 minutes of arrival, if clinically indicated (do not delay CT for EKG or CXR).</li> <li>• Initiate Social Services consult for family, if appropriate</li> <li>• 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.</li> </ul>
<b>CNA</b>	<ul style="list-style-type: none"> <li>• Assist ED nurse to undress patient into a hospital gown, perform vital signs, and EKG (do not delay CT for EKG).</li> <li>• Complete patient belongings list.</li> <li>• Run elevator for emergent stroke patients as needed.</li> <li>• Document output.</li> </ul>
<b>ED Physician</b>	<ul style="list-style-type: none"> <li>• Determine code intervention and review Advance Directives or POLST form, if present.</li> <li>• Initiate bed request for either NSICU or 10K based on admission criteria outlined below.</li> </ul>
	<p><b>Evaluation of Probable TIA (deficit resolved)</b></p> <ol style="list-style-type: none"> <li>1. Admit to Observation Unit to complete evaluation as needed.</li> <li>2. Obtain CT without contrast, CBC, INR, PTT, BMS, and 12 lead EKG if not already performed in acute.</li> </ol>

3. Bilateral duplexes of the carotid artery if symptoms consistent with anterior circulation and if not done within last 3 months.
4. 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.
5. Nurse swallow screen to be completed prior to any po intake (see Bedside Nurse Swallow Screen , Cog/Neuro section of ED RN Advanced Navigator.
6. Fasting lipid levels in am.
7. Focused neuro checks every 2 hours.
8. Neurology consult not needed if the following are met:

- a. Complete resolution and no recurrence of symptoms
- b. Carotid stenosis on symptomatic side <50%

These patients should have follow-up arranged in the Stroke Clinic (503-494-7225).

9. Consider Neurology consult if any are present:
  - a. Patient age < 50.
  - b. Recent head or neck trauma.
  - c. If suspected posterior circulation event.
  - d. Significant medical co-morbidities (i.e. uncontrolled diabetes or hypertension).
  - e. New onset atrial fibrillation.
  - f. Psychosocial issues (i.e. lack of family support).
10. Must get Neurology consult if any are present:
  - a. Symptoms still present or are recurrent.
  - b. Acute stroke within past month.
  - c. Carotid stenosis >50% on symptomatic side. (These patients to be considered for stent of CEA.)
  - d. MRI/MRA performed.

**Criteria for Admission to Neurosciences ICU**

1. Acute stroke symptom onset of < 24 hours.
2. Post IV (intravenous) or IA (intra-arterial) thrombolytics or device thrombectomy.
3. Patients with hemispheric stroke in whom impending mental status decline and loss of protective airway reflexes is of concern.
4. Patients with basilar thrombosis or tip of the basilar syndrome.
5. Patients with crescendo TIAs.
6. Patient requiring blood pressure augmentation for a documented area of hypoperfusion.
7. Patients requiring IV blood pressure or heart rate control.
8. Patients requiring continuous cardiac monitoring.
9. Patients requiring q 1-2 hour neurological evaluation depending on symptom fluctuation or if ongoing ischemia is suspected.
10. Patients with worsening neurological status.

Complete EPIC Orders, NEU: Stroke/Rule Out Stroke/TIA: Admission. .

**Criteria for Admission to 10K:**

1. Acute stroke symptom onset > 24 hours and not meeting above criteria.
2. Non-crescendo TIAs where workup not completed.

	<p>Complete EPIC Orders, NEU: Stroke/Rule Out Stroke/TIA: Admission.</p> <p><b>Note:</b> Remote telemetry is available on 10K that is monitored by 11K.</p>
	<p><b>Criteria for Discharge to Home:</b></p> <ol style="list-style-type: none"> <li>1. Completion of evaluation.</li> <li>2. No significant findings on the above workup.</li> <li>3. Complete resolution and no recurrent symptoms.</li> <li>4. Anti-platelet agents or resume warfarin, if indicated.</li> <li>5. Consider starting on a cholesterol-reducing agent if elevated fasting lipid levels.</li> <li>6. Follow-up arranged in Stroke Clinic (503-494-7225).</li> <li>7. 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.</li> </ol>
	<p><b>Blood Pressure Management in Patients NOT eligible for thrombolytics</b></p>
	<p>1. Systolic <math>\leq</math> 220 OR diastolic <math>\leq</math> 120:</p> <ul style="list-style-type: none"> <li>• Observe unless other end-organ involvement (e.g., aortic dissection, acute myocardial infarction, pulmonary edema, hypertensive encephalopathy).</li> <li>• 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.</li> </ul>
	<p>2. Systolic <math>&gt;</math> 220 OR diastolic 121-140:</p> <ul style="list-style-type: none"> <li>• Labetalol 10-20 mg IV given over 1-2 minutes.</li> <li>• May repeat or double every 10 minutes (maximum dose 300 mg) OR</li> <li>• Nicardipine 5 mg/hour IV infusion as initial dose; titrate to desired effect by increasing rate by 2.5 mg/hour every 5 minutes to maximum of 15 mg/hour.</li> <li>• Aim for a 10-15% reduction in BP.</li> </ul>
	<p>3. Diastolic <math>&gt;</math> 140:</p> <ul style="list-style-type: none"> <li>• Nitroprusside 0.5 mcg/kg/min IV infusion as initial dose with continuous BP monitoring.</li> <li>• Aim for a 10-15% reduction in BP.</li> </ul>
	<p><b>Blood Pressure Management in Patients eligible for thrombolytics</b></p>
	<p>Prethrombolytics:</p> <p>Systolic <math>&gt;</math>185 OR diastolic <math>&gt;</math>110</p> <ul style="list-style-type: none"> <li>• Labetalol 10-20 mg IV given over 1-2 minutes.</li> <li>• May repeat one time or nitropaste 1-2 inches.</li> </ul>

During/after thrombolytics:

1. Monitor blood pressure. Check blood pressure every 15 minutes for 2 hours, then every 30 minutes for 6 hours, and then every hour for 16 hours.
2. Systolic 180-230 OR diastolic 105-120
  - Labetalol 10 mg IV given over 1-2 minutes. May repeat or double labetalol every 10-20 minutes to maximum dose of 300 mg or give initial labetalol dose, then start labetalol drip at 2-8 mg/min.
3. Systolic >230 OR diastolic 121-140
  - Labetalol 10 mg IV given over 1-2 minutes. May repeat or double labetalol every 10 minutes to maximum dose of 300 mg, or give initial labetalol dose, then start labetalol drip at 2-8 mg/min.

OR

  - Nicardipine 5 mg/hour IV infusion as initial dose and titrate to desired effect by increasing rate by 2.5 mg/hour every 5 minutes to maximum of 15 mg/hour. If blood pressure not controlled by labetalol, consider nitroprusside.
4. Diastolic >140:
  - Sodium nitroprusside 0.5 mcg/kg/min IV infusion initial dose and titrate to desired blood pressure.

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**Bibliography:**

- Adams, H. P., et al. (2007). Guidelines for the Early Management of Adults with Ischemic Stroke: A Guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups. *Stroke* (38), pp. 1655-1711.
- Bhardwaj, A., Mirski, M. A., & Ulatowski, J. A. (Eds.). (2004). *Handbook of Neurocritical Care*. Totowa, New Jersey: Humana Press.
- [Cincinnati Prehospital Stroke Scale](#)
- Del Zoppo, G. J., et al. (2009). Expansion of the time window for treatment of acute ischemic stroke with intravenous tissue plasminogen activator: A science advisory from the AHA/ASA. *Stroke* (40), pp. 1-4.
- Oregon Stroke Center (OSC), Acute Stroke Personnel, Accessing the Acute Stroke Team, and OSC Internal Pager/Call System
- Sacco, R. L., et al. (2006). Guidelines for Prevention of Stroke in Patients with Ischemic Stroke or Transient Ischemic Attack: A Statement for Healthcare Professionals from the American Heart Association/American Stroke Association Council on Stroke. *Stroke*, 37, pp. 577-617.

**Related Forms and Procedures:**

- [OHSU Practice Standard for Intravenous Administration of t-PA in Acute Ischemic Stroke, PS01.12](#)

**Education & Training Resources:** None

**Document History:** None

**Originator/Author:**

OHSU Stroke Advisory Committee

Revised by:

**Approved By:**

OHSU Stroke Advisory Committee (2007, 2008)

OHSU Emergency Department Operations Committee (2007)

OHSU Nursing Practice Council (2007)

OHSU Medical Executive Committee (2007)

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OHSU Stroke Center (1/10)

Neurosciences Best Practices Committee, June 2008 & 1/22/10

OHSU Emergency Department Operations Committee (2008 & 2/2/10)

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