

EMERGENCY DEPARTMENT STROKE PROVIDER GUIDE

Stroke – At least 50% of patients presenting with suspected stroke within first 4.5 hours of the time symptoms noted should have CT scan performed within 20 minutes of arrival.

Ischemic stroke

Up to 2 million brain cells die each minute during a stroke.

1. Treatment with IV alteplase is considered Standard-of-Care when given to eligible patients in the first 4.5 hours from time of stroke onset. Please refer to your stroke protocol and consult with neurological expertise to determine eligibility.
2. Treatment with mechanical thrombectomy is considered Standard-of-Care for patients with proximal large vessel occlusion (LVO) who are <6 hours from time of stroke onset. Initiate transfer as soon as high suspicion of LVO determined (clinical or imaging).
3. Treatment with mechanical thrombectomy is considered Standard-of-Care for patients with proximal LVO who are 6-24 hours from last seen normal, if advanced imaging supports a favorable pattern. Consult with higher level of care with thrombectomy to determine if patient meets criteria for transfer.

Definitions:

1. Last Seen Normal (LSN) may also be referred to as Last Known Well. LSN is the time the patient reports being in normal state or was last seen in normal state, if unable to provide history.
2. Time Symptoms Noted (TSN) is the time the new symptoms/signs were first noted by patient or witness.
3. If the patient was awake at the time of symptom onset or the stroke signs were witnessed, LSN = TSN = Time of Stroke Onset (TSO).
4. If the patient is unable to provide onset time and the stroke signs were not witnessed, LSN is before TSN and TSO is unknown, but sometime between LSN and TSN.

A stroke code should be activated for all patients with ANY stroke symptom presenting **<4.5 hours** from the time symptoms were noted and for all VAN + patients presenting **<24 hours** from the time symptoms were noted. This should include patients who present <24 hours after being found or awakening with symptoms.

Stroke symptoms:

- Severe, unexplained headache
- Dizziness/Vertigo
- Visual loss
- Communication deficit
- facial or limb weakness or numbness
- Incoordination or disruption of gait
- Sudden loss of vision

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Stroke VAN

How weak is
the patient?
Raise both arms

- ☐ Mild (minor drift)
- ☐ Moderate (severe drift - touches or nearly touches ground)
- ☐ Severe (flaccid or no antigravity)
- ☐ Patient shows no weakness.
Patient is VAN negative

(exceptions are confused or comatose patients with dizziness, focal findings, or no reason for their altered mental status then basilar artery thrombus must be considered; CTA is warranted)

Visual disturbance

- ☐ Field cut (which side) (4 quadrants)
- ☐ Double vision (ask patient to look to right then left; evaluate for uneven eyes)
- ☐ Blind new onset
- ☐ None

Aphasia

- ☐ Expressive (inability to speak or paraphasic errors); do not count slurring of words (repeat and name 2 objects)
- ☐ Receptive (not understanding or following commands) (close eyes, make fist)
- ☐ Mixed
- ☐ None

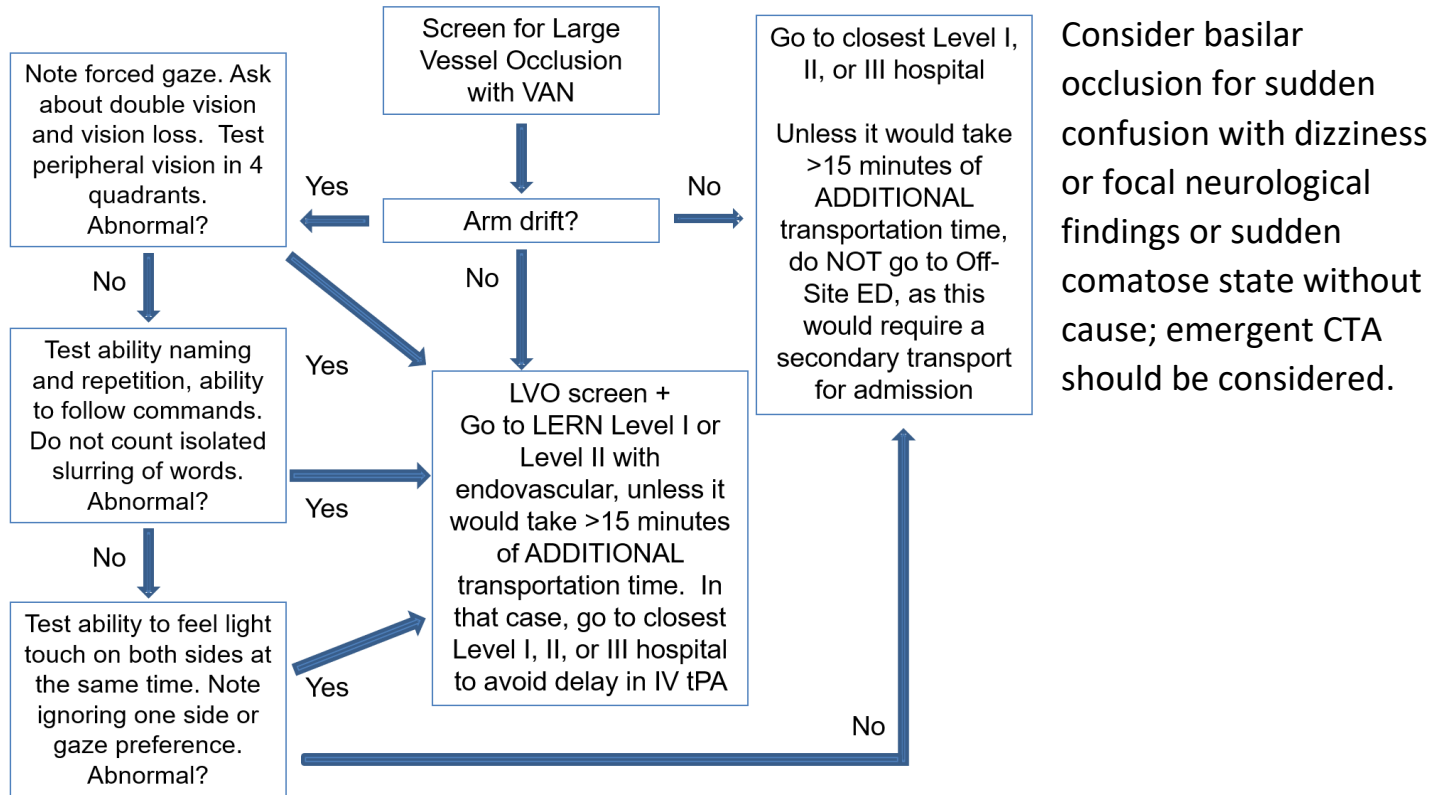
Neglect

- ☐ Forced gaze or inability to track to one side
- ☐ Unable to feel both sides at the same time, or unable to identify own arm
- ☐ Ignoring one side
- ☐ None

A patient is VAN positive if limb weakness is present in addition to impairment in Vision, Aphasia, and/or Neglect.

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Screening algorithm for large vessel occlusion (LVO)



Stroke Code

- ◆ Announce overhead alert and call the neurologist on call.
- ◆ Door-to-ED doc time target is **≤10 minutes**. This is the time **you** document first seeing the patient.
- ◆ Door-to-neuro expertise time target is **≤15 minutes**. This is the time documented that the neurologist has been made aware of the patient. Anyone (triage, clerk, nurse, mid-level, MD) can activate code stroke. Determine whose role it is to document the time the neurologist was reached.
- ◆ Door-to-CT performed is now **≤20 minutes**. If the door-to-ED doc time target is met, there is no reason that door-to-CT performed target time should not be met.
- ◆ Door-to-CT interpreted is now **≤35 minutes**. If the door-to-neuro expertise time target is met, the neurologist (if credentialed to interpret emergent neuroimaging) can provide and document a “real time” interpretation and should meet this target time.
- ◆ Door-to-labs resulted target time is now **≤35 minutes**. The only lab mandatory to push tPA/TNK in a patient with no exposure to anticoagulation and no reason to suspect low platelets or coagulopathy is blood glucose (accucheck) based on AHA/ASA Guidelines for Emergency Management of the Patient with Acute Ischemic Stroke.
- ◆ Door-to-needle time target is now **≤45 minutes**. If the door-to-needle time is > 45minutes, you **MUST** document the reason/s for the delay.

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For patients with low NIHSS and/or perceived mild symptoms:

- Among patients presenting within 2 hours of stroke who were **not treated with a thrombolytic** due to mild or rapidly improving stroke symptoms, **28% could not ambulate without assistance at discharge** and did not get discharged to home.
 - o **Even NIHSS = 0 stroke patients can be disabled**; 16% could not ambulate without assistance at discharge and did not get discharged to home.
- While the PRISMS trial did not demonstrate benefit of alteplase over placebo, the trial excluded patients for any potentially disabling deficits.
- Disability is in the “eye of the beholder.”
 - o **Ask patients with perceived minor deficits if the symptoms/deficits, if persistent, would be disabling.**
 - o **Test ability to walk and use both hands** for two-handed tasks before deciding the patient has absence of disabling deficits.
 - o Consider that a **visual field cut may preclude driving.**
- **Alteplase/tPA or tenecteplase/TNK has been proven to reduce the odds of disability.** For patients with mild but disabling stroke symptoms, IV alteplase is indicated within 3 h from symptom onset of ischemic stroke.
- The risk of hemorrhage is about half that of patients treated in the NINDS randomized clinical trial of tPA for stroke. **The risk of symptomatic ICH with worsening of NIHSS by at least 4 points was 1.3% in PRISMS.**

From AHA/ASA Guidelines:

“There should be **no exclusion** for patients with **mild but nonetheless disabling stroke symptoms**, in the opinion of the treating physician, from treatment with IV alteplase because there is proven clinical benefit for those patients.[†] (*Class I; LOE B-R*)[‡]”

“Within 3 h from symptom onset, treatment of patients with mild ischemic stroke symptoms that are judged as nondisabling may be considered. Treatment risks should be weighed against possible benefits; however, more study is needed to further define the risk-to-benefit ratio.[†] (*Class IIb; LOE C-LD*)[‡]”

“For otherwise eligible patients with **mild stroke presenting in the 3-to 4.5-hour window**, treatment with IV alteplase may be **reasonable**. Treatment risks should be weighed against possible benefits.”

“For otherwise eligible patients with mild stroke presenting in the 3- to 4.5-h window, IV alteplase may be as effective as treatment in the 0- to 3-h window and may be a reasonable option. Treatment risks should be weighed against possible benefits. (*Class IIb; LOE B-NR*)^{||}”

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Hemorrhagic stroke

CT scan should be performed within 20 minutes of arrival. CTA head should be considered to identify patients at risk of hematoma expansion and to evaluate for underlying vascular malformations; post contrast CT scan may identify a tumor. If patient is deteriorating, **do NOT** keep HOB flat for advanced imaging.

Determine severity with ICH Score:

Intracerebral Haemorrhage

ICH Score (Hemphill et al.)

Feature	Finding	Points
GCS	3-4	2
	5-12	1
	13-15	0
Age	>=80	1
	<80	0
Location	Infratentorial	1
	Supratentorial	0
ICH volume	>=30cc	1
	<30cc	0
Intraventricular Blood	Yes	1
	No	0
ICH SCORE		0-6 points

ICH Score	30 Day Mortality
0	0%
1	13%
2	26%
3	72%
4	97%
5	100%
6	100%

- ◆ Reverse coagulopathy when present based on coagulopathy reversal guidelines: (PCC or FFP with Vitamin K for Warfarin; Andexxa or PCC for Factor Xa inhibitor (Eliquis, Xarelto, Edoxaban); Praxbind or PCC for Pradaxa/dabigatran).
- ◆ Reduce SBP 120-140mmHg; if transferred, ensure BP has reached target before sending
- ◆ HOB elevated to 30 degrees; do not leave HOB flat for prolonged imaging or during transfer
- ◆ Prophylactic antiseizure medication is not recommended
- ◆ Consult with neurology and/or neurosurgery for determination of neurosurgical intervention

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This page should be individualized for each center based on available resources.

Patients who can stay at xxxxx and do NOT require transfer (each site must edit based on capabilities):

1. Any stroke patient as recommended by neurologist
2. Most patients who are treated with IV tPA/TNK (excludes patients who are transferred for thrombectomy)
3. Most ischemic stroke patients who are unlikely to require neurosurgical intervention due to brain edema.
4. Intracerebral hemorrhage not meeting reason/s for transfer (see below).
5. May consider monitoring a small traumatic SAH in patient with GCS 15 (vascular anomaly has been ruled out).

Patients who cannot stay at XXX and should transfer:

1. Subarachnoid hemorrhage. Should transfer to XXX using the Transfer Protocol.
2. Intracerebral hemorrhage only if involving the cerebellum or with IVH/hydrocephalus or deemed by neurologist to be at high risk of developing hydrocephalus. These patients can transfer to xxxxx, based on the recommendation of neurologist.
3. Ischemic stroke due to large vessel occlusion in the window for mechanical thrombectomy after consultation with neurologist. Should transfer to xxxxxx using the Transfer Protocol.
4. Ischemic stroke in territory at high risk for requiring decompressive craniectomy.