

**2018
UPDATE**

QUICK SHEET

GUIDELINES FOR THE EARLY MANAGEMENT OF PATIENTS WITH ACUTE ISCHEMIC STROKE

A Summary for Healthcare Professionals from the American Heart Association/American Stroke Association

KEY TAKEAWAYS

The 2018 comprehensive guideline updates guidance on which patients are eligible to receive IV alteplase, mechanical thrombectomy and other stroke treatments to reduce long-term morbidity.

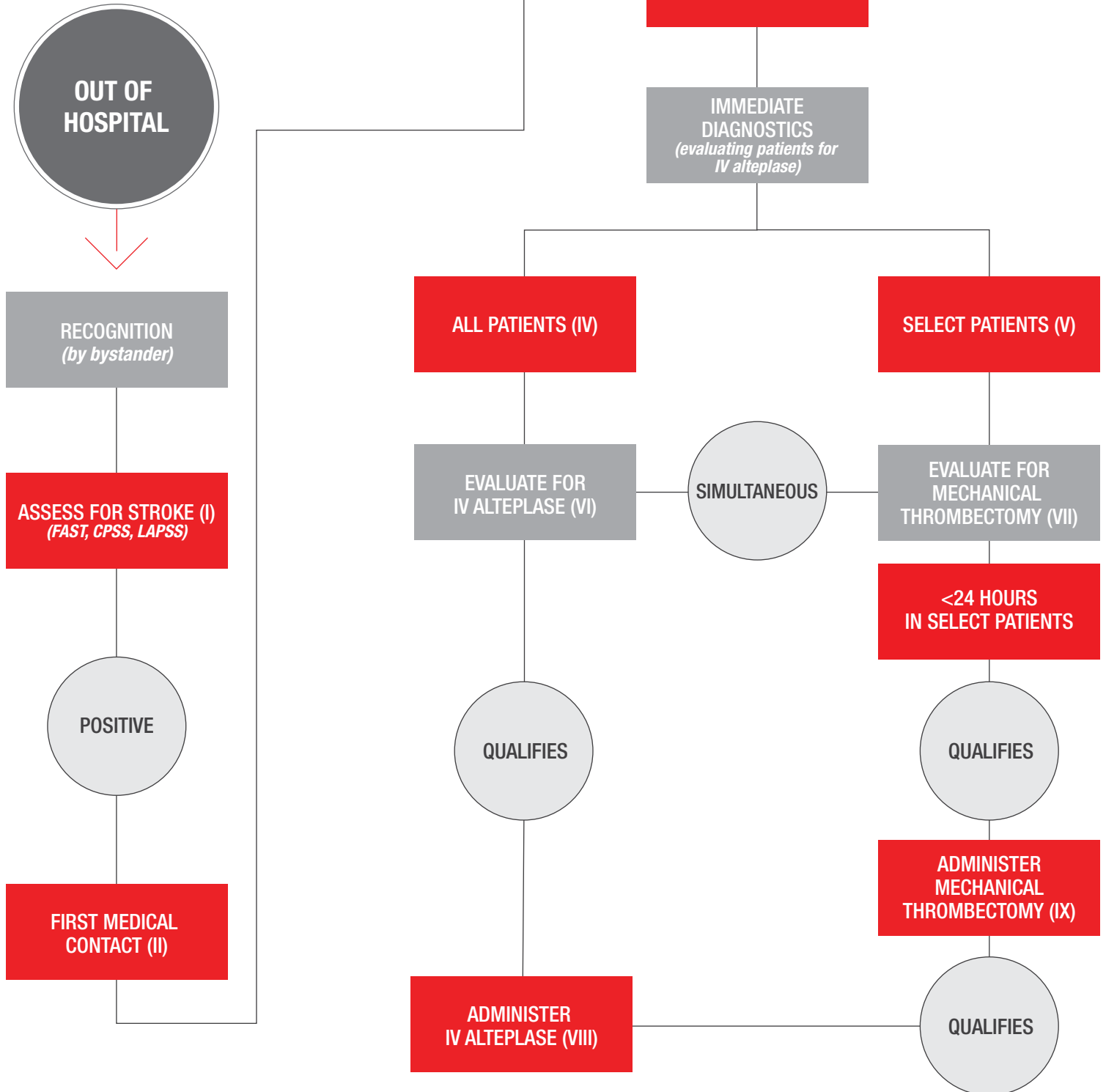
- IV alteplase within 4.5 hours of stroke onset remains the standard of care for most ischemic stroke patients, providing the opportunity for more favorable outcomes. Patients eligible for IV alteplase should receive it, even if mechanical thrombectomy is being considered.
- Mechanical thrombectomy using stent retrievers within up to 24 hours of stroke onset may lead to faster and more complete reperfusion for certain patients.
- In select patients with AIS within 6-16 hours of last known normal who have large vessel occlusion in the anterior circulation and have favorable imaging studies, mechanical thrombectomy is recommended.
- The benefits of both IV alteplase and mechanical thrombectomy are time dependent. The earlier the treatment within the time window, the greater the benefit to patients.

Regional systems of early stroke care should be developed that coordinate first-contact services with local and regional hospitals to achieve minimum delay time from symptom onset to definitive treatment.

- Recommend brain imaging studies be performed within 20 minutes of arrival in the ED for patients who may be candidates for IV alteplase and/or mechanical thrombectomy.
- Time from symptom onset to intravenous IV alteplase should be less than 3 hours and never more than 4.5 hours.
- Time from first stroke symptom to mechanical thrombectomy should be as quickly as possible within up to 24 hours in select patients.
- To achieve expedited care, public awareness of the signs of stroke and importance of calling 9-1-1 immediately by the community is needed.¹

The path to achieve these goals is represented in the flow chart on the next page.

EARLY ACUTE ISCHEMIC STROKE CARE MANAGEMENT FLOW CHART



TEXT COPY FOR NUMBERED SECTIONS OF THE FLOW CHART:

EMS Team to identify if there is evidence of an Acute Ischemic Stroke.

- I** Assess for stroke using a validated screening tool, such as F.A.S.T., Cincinnati Prehospital Stroke Scale, or Los Angeles Prehospital Stroke Screen³



**also note time of day - hour and minute*

- II** First Medical Contact (EMS Provider)¹ – Assess and manage ABCs (airway, breathing, circulation)

- Check and monitor blood pressure, but do not treat
- Initiate cardiac monitoring
- Provide supplemental oxygen to maintain O₂ saturation > 94%
- Establish IV access
- Determine blood glucose and treat accordingly
- Determine time of symptom onset or last known normal, and obtain family contact information, preferably a cell phone
- Triage and rapidly transport patient to nearest, most appropriate stroke hospital
- Notify hospital of pending stroke patient arrival
- Severity stroke scales/assessment of large vessel occlusion (RACE, LAMS or CPSSS)

- III** NIHSS in Emergency Department

- IV** Immediate Diagnostics – All Patients¹

- Noncontrast brain CT or brain MRI (within 20 minutes of ED arrival)
- Blood glucose level
- Oxygen saturation
- Serum electrolytes/renal function tests
- CBC, including platelet testing
- Markers of cardiac ischemia
- Prothrombin time (PT)/INR
- Activated partial thromboplastin time (aPTT)
- ECG

- V** Immediate Diagnostics – Select Patients¹

- Thrombin time (TT) and/or ecarin clotting time (ECT) if it is suspected the patient is taking direct thrombin inhibitors or direct factor Xa inhibitors
- Hepatic function tests
- Toxicology screen
- Blood alcohol level
- Pregnancy test
- Arterial blood gas tests if hypoxia is suspected
- Chest radiography if lung disease is suspected
- Lumbar puncture if subarachnoid hemorrhage is suspected and CT scan is negative for blood
- Electroencephalogram if seizures are suspected
- CT-A (angiogram) and/or CT-P (perfusion)

TEXT COPY FOR NUMBERED SECTIONS OF THE FLOW CHART CONTINUED:

VI IV alteplase eligibility¹

Indications (Class I)

- If within 3 hours of onset
 - ≥ 18 years of age
 - Severe stroke
 - Mild but disabling stroke
- If 3-4.5 hours from onset, 18-80 years of age, without
 - A history of both diabetes mellitus and prior stroke
 - NIHSS score ≤25
 - Taking any OACs
 - Imaging evidence of ischemic injury involving more than one third of the MCA territory
- If BP can be lowered safely and maintained < 185/110 mm Hg
- With Blood glucose > 50 mg/dL
- With mild to moderate early ischemic changes on NCCT
- With antiplatelet drug monotherapy or combination therapy
- With end stage renal disease with normal aPTT

Contraindications (Class III)

- Unclear time and/ or unwitnessed symptom onset and in whom the time last known to be at baseline state is >3 or 4.5 hours
- Awoke with stroke with time last known to be at baseline state >3 or 4.5 hours
- CT reveals an acute intracranial hemorrhage
- CT brain imaging exhibits extensive regions of clear hypoattenuation
- Prior ischemic stroke within 3 months
- Recent severe head trauma within 3 months
- Posttraumatic infarction that occurs during the acute in-hospital phase
- Intracranial/spinal surgery within the prior 3 months
- History of intracranial hemorrhage
- Symptoms and signs most consistent with an SAH
- Structural GI malignancy
- Gastrointestinal bleeding event within 21 days
- Platelets <100 000/mm³
- INR >1.7
- aPTT >40 s
- PT >15 s
- Treatment dose of LMWH within the previous 24 hours
- Taking direct thrombin inhibitors or direct factor Xa inhibitors appropriate coagulation activity assays are normal or the patient has not received a dose of these agents for >48 hours (assuming normal renal metabolizing function)
- Concurrent administration of antiplatelet agents that inhibit the glycoprotein IIb/IIIa receptor outside a clinical trial
- Symptoms consistent with infective endocarditis
- Known or suspected to be associated with aortic arch dissection
- Intra-axial intracranial neoplasm

TEXT COPY FOR NUMBERED SECTIONS OF THE FLOW CHART CONTINUED:

Additional Recommendations (Class IIa and IIb). Situations requiring Individual Patient Risk Benefit Assessment for which administration of IV alteplase may be considered

- If within 3 hours of onset
 - Mild non-disabling symptoms
- If 3-4.5 hours from onset
 - 80 years of age
 - Taking warfarin and with an INR ≤ 1.7
 - Both prior stroke and diabetes mellitus
 - Mild stroke
 - NIHSS > 25
- Pre-existing disability (mRS ≥ 2)
- Pre-existing dementia
- Moderate to severe ischemic stroke with early improvement but remain moderately impaired and potentially disabled
- Seizure at the time of onset, if evidence suggests that residual impairments are secondary to stroke
- Initial blood glucose levels < 50 or > 400 mg/dL with persistent deficits after glucose control
- Clinical history of potential bleeding diathesis or coagulopathy
- History of warfarin use and an INR ≤ 1.7 and/or a PT < 15 s
- Lumbar dural puncture in the preceding 7 days
- Arterial puncture of a noncompressible blood vessel in the 7 days
- Recent major trauma (within 14 days) not involving the head
- Major surgery in the preceding 14 days
- Genitourinary bleeding or gastrointestinal bleeding within previous 21 days
- Women who are menstruating and do not have a history of menorrhagia
- Women with recent or active history of menorrhagia without clinically significant anemia or hypotension
- Recent or active vaginal bleeding causing clinically significant anemia (after emergency consultation with a gynecologist)
- Extracranial cervical arterial dissection
- Intracranial arterial dissection
- Unruptured and unsecured intracranial aneurysm
- Unruptured and untreated intracranial vascular malformation
- CMBs demonstrated on MRI (risk of ICH higher is burden of CMBs > 10)
- Extra-axial intracranial neoplasm
- Concurrent acute MI
- MI in the past 3 months
- Acute pericarditis
- Major AIS likely to produce severe disability and known left atrial or ventricular thrombus
- Major AIS likely to produce severe disability and cardiac myxoma or papillary fibroelastoma
- AIS due to complications of cardiac or cerebral angiographic procedures
- Systemic malignancy and > 6 month life expectancy in the absence of other contraindications
- Pregnancy
- Early postpartum period (< 14 days after delivery)
- History of diabetic hemorrhagic retinopathy or other hemorrhagic ophthalmic conditions
- Sickle cell disease
- Illicit drug use
- Stroke mimics

TEXT COPY FOR NUMBERED SECTIONS OF THE FLOW CHART CONTINUED:

VII Evaluate for Mechanical Thrombectomy (< 24 hours)¹

- **Evaluation for IV alteplase and evaluation for mechanical thrombectomy happens simultaneously**
- Within 6 hours:
 - Prestroke mRS score 0–1
 - Acute ischemic stroke receiving intravenous IV alteplase within 4.5 hours of onset
 - Causative occlusion of the ICA or proximal MCA (M1)
 - Age ≥18 years
 - NIHSS score of ≥6
 - ASPECTS of ≥6
 - For those select patients in whom mechanical thrombectomy initiated within 6-24 hours have LVO in anterior circulation and meet other eligibility criterias recommended

VIII Administer IV alteplase¹

- Infuse 0.9 mg/kg (maximum dose 90 mg) over 60 minutes, with 10% of the dose given as a bolus over 1 minute
- Admit the patient to an intensive care or stroke unit for monitoring for at least 24 hours
- If the patient develops severe headache, acute hypertension, nausea, or vomiting or has a worsening neurological examination, discontinue the infusion (if IV alteplase is being administered) and obtain emergent CT scan

- Measure BP and perform neurological assessments every 15 min during and after IV alteplase infusion for 2 hours, then every 30 min for 6 hours, then every hour until 24 hours after IV alteplase treatment.
- Increase the frequency of BP measurements if systolic BP is >180 mm Hg or if diastolic BP is >105 mm Hg. Administer antihypertensive medications to maintain blood pressure at or below these levels.
- Delay placement of nasogastric tubes, indwelling bladder catheters, or intra-arterial pressure catheters if the patient can be safely managed without them
- Obtain a follow-up CT or MRI scan at 24 hours after IV alteplase before starting anticoagulants or antiplatelet agents

IX Administer Mechanical Thrombectomy¹

- In select patients with AIS within 6-16 hours of last known normal who have large vessel occlusion in the anterior circulation and have favorable imaging studies, mechanical thrombectomy is recommended
- Imaging studies may indicate some patients could reasonably have mechanical thrombectomy up to 24 hours after last known normal
- In patients who undergo mechanical thrombectomy, it is reasonable to maintain blood pressure ≤180/105 during and for 24 hours after the procedure

More information:
StrokeAssociation.org/AISToolkit

