

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

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Acute Ischemic Stroke

A 67 year-old female with hypertension presents to the ED via EMS as a stroke alert complaining of left-sided weakness. Per the report given by paramedics, the patient was having lunch with her husband around 1PM when she suddenly developed complete loss of motor and sensory function of her left side. Not realizing the seriousness of the condition, the couple waited for the symptoms to resolve before calling EMS. EMS arrived at 2:30PM and immediately brought her to the ED. On arrival at 3PM, patient's vitals were stable aside from blood pressure 180/105. Neuro exam was remarkable for left sided facial droop, 0/5 strength and sensation on the left side. CT head showed severe occlusion of the right MCA. Current time is 330PM. Which of the following is the most appropriate initial treatment for this patient's condition?

- A. Mechanical thrombectomy
- B. Administer IV alteplase therapy
- C. Comfort measures. Patient is beyond the window for treatment
- D. Labetalol



[Radiopedia.org/cases/ischemic-stroke](https://radiopedia.org/cases/ischemic-stroke)

MCA Distal Main stem territory Infarction

Acute ischemic stroke is the sudden loss of blood circulation to an area of the brain, resulting in a corresponding loss of neurological function. It can be caused by thrombotic or embolic occlusion of a cerebral artery.

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

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The correct answer is B. Administer IV alteplase therapy.

tPA or Alteplase is the mainstay of treatment for acute ischemic stroke. The treatment must be initiated within 4.5 hours of clearly defined symptom onset.

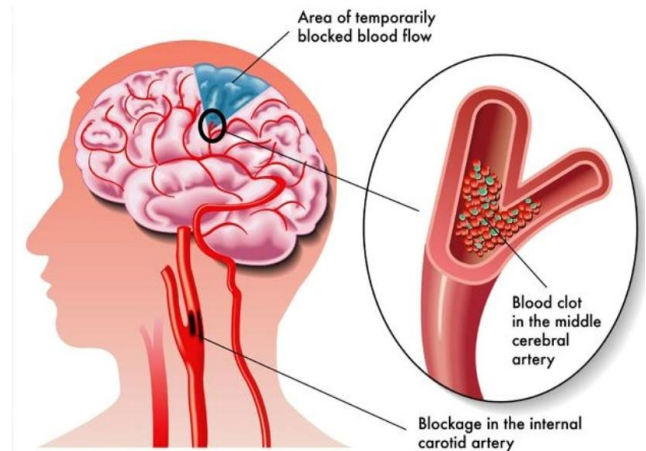
Discussion

The main goals in the initial phase of acute stroke management are to ensure medical stability, quickly reversing any conditions that are contributing to the patient's problem and determining if patients with acute ischemic stroke are candidates for IV thrombolytic therapy or endovascular thrombectomy.

Airway, breathing and circulation – It is important to assess vitals signs and ensure stable airway, breathing and circulation in acute stroke patients. Hypoventilation, with increasing carbon dioxide, may lead to cerebral vasodilation and elevated intracranial pressure. In these cases, intubation may be necessary to restore adequate ventilation and protect airway from aspiration.

History and Physical – Establishing the time of ischemic stroke symptoms onset through a rapid but detailed history and physical is critical. It is the main determinant of eligibility for treatment with IV thrombolysis (<4.5 hours) or mechanical thrombectomy (< 24 hours).

Immediate Lab Studies – Urgent brain imaging with CT or MRI. Blood glucose, EKG, CBC, Troponin, PT and INR are all studies that need to be ordered ASAP.



(via <http://www.pmrpressrelease.com/tag/acute-ischemic-stroke>)

Reperfusion Therapy

Alteplase initiates local fibrinolysis by binding to fibrin in a thrombus (clot) and converting entrapped plasminogen to plasmin. In turn, plasmin breaks up the thrombus. The benefit of IV thrombolysis for acute ischemic stroke decreases continuously over time from symptom onset. Each 15-minute reduction in the time to initiation of tPA was associated with an increase in the odds of walking independently at discharge and being discharged to home rather than institution.

Mechanical thrombectomy is indicated for patients with acute ischemic stroke due to a large artery occlusion in the anterior circulation who can be treated within 24 hours of the time last known to be well. Patients should receive IV tPA without delay, even if eligible for mechanical thrombectomy.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and **click** on the **"Conference"** link.

All are welcome to attend!

Eligibility criteria for the treatment of acute ischemic stroke with intravenous alteplase (recombinant tissue plasminogen activator or tPA)

Inclusion criteria	
Clinical diagnosis of ischemic stroke causing measurable neurologic deficit	
Onset of symptoms <4.5 hours before beginning treatment; if the exact time of stroke onset is not known, it is defined as the last time the patient was known to be normal or at neurologic baseline	
Age ≥18 years	
Exclusion criteria	
Patient history	
Ischemic stroke or severe head trauma in the previous three months	
Previous intracranial hemorrhage	
Intra-axial intracranial neoplasm	
Gastrointestinal malignancy or hemorrhage in the previous 21 days	
Intracranial or intraspinal surgery within the prior three months	
Clinical	
Symptoms suggestive of subarachnoid hemorrhage	
Persistent blood pressure elevation (systolic ≥185 mmHg or diastolic ≥110 mmHg)	
Active internal bleeding	
Presentation consistent with infective endocarditis	
Stroke known or suspected to be associated with aortic arch dissection	
Acute bleeding diathesis, including but not limited to conditions defined under 'Hematologic'	
Hematologic	
Platelet count <100,000/mm ³ *	
Current anticoagulant use with an INR >1.7 or PT >15 seconds or aPTT >40 seconds or PT >15 seconds*	
Therapeutic doses of low molecular weight heparin received within 24 hours (eg, to treat VTE and ACS); this exclusion does not apply to prophylactic doses (eg, to prevent VTE)	
Current use of a direct thrombin inhibitor or direct factor Xa inhibitor with evidence of anticoagulant effect by laboratory tests such as aPTT, INR, ECT, TT, or appropriate factor Xa activity assays	
Head CT	
Evidence of hemorrhage	
Extensive regions of obvious hypodensity consistent with irreversible injury	

Hacke W, Kaste M, Bluhmki E, et al. Thrombolysis with alteplase 3 to 4.5 hours after acute ischemic stroke. *N Engl J Med* 2008; 359:1317.

Complications

The most feared complication of thrombolytic therapy is symptomatic intracerebral hemorrhage. Asymptomatic intracerebral hemorrhage, systemic bleeding and angioedema are other complications that may arise.

Take Home Points

- Time is of the essence! Patients with signs of acute ischemic stroke should be considered for IV alteplase therapy within 4.5 hours of onset of symptoms.
- History and Physical is important to determine the time of onset of symptoms
- The most feared complication is symptomatic intracerebral hemorrhage.



ABOUT THE AUTHOR

This month's case was written by Christopher Do. Christopher is a 4th year medical student from NSU-COM. He did his emergency medicine rotation at BHMC in September 2019. Christopher plans on pursuing a career in Internal Medicine after graduation.

REFERENCES

Powers WJ, Rabinstein AA, Ackerson T, et al. 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.

Jaunch, E. (2019, March 28). ISchemic Stroke. Medscape. Retrieved 09/22/2019 from <https://emedicine.medscape.com/article/1916852-overview>

Filho, J., & Samuels, O. (2019). Intravenous Thrombolytic therapy for acute ischemic stroke: therapeutic use. UpToDate. Retrieved September 22, 2019, from https://www.uptodate.com/contents/intravenous-thrombolytic-therapy-for-acute-ischemic-stroke-therapeutic-use?search=IV%20thrombolytic%20therapy%20for%20acute%20ischemic%20stroke&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1