Acute CVA - Strokes

Shavonne Borchardt D.O.
Emergency Medicine - Chief Resident
Garden City Hospital

Strokes

- Refers to any interruption of blood flow to the brain
  - Ischemic vs. Hemorrhagic
  - 80% are ischemic
  - Ischemic
    - Thrombosis
    - Embolism
    - Hypoperfusion
  - Hemorrhagic
    - Intracerebral Hemorrhage (more common)
    - Nontraumatic Subarachnoid Hemorrhage

Ischemic Thrombotic Stroke

- Signs and symptoms develop gradually over minutes to hours
  - May wax and wane in severity
  - History of TIAs
- Most commonly caused by athersclerosis
  - Vasculitis, polycythemias, hypercoagulable states
  - HIV, syphilis, tuberculosis, aspergillosis, trichinosis

Embolic Ischemic Stroke

- Intravascular material is released occluding distal vessel
- 1/5th of all ischemic strokes
- Causes: cardiac valvular vegitations, mural thrombi, paradoxical emboli (ASD, VSD), cardiac tumors, fat emboli, particulate emboli (IVDA), septic emboli

Hypoperfusion Ischemic Stroke

- Less common – typically caused by cardiac failure
- Symptoms wax and wane with hemodynamic parameters

Intracerebral Hemorrhagic Stroke

- More common than nontraumatic subarachnoid hemorrhage
- Bleeding occurs directly into brain parenchyma from small arterioles weakened from HTN
- Risk factors: TMB, prior stroke, smoking and alcohol abuse, amyloidosis, bleeding diathesis, cocaine use

Subarachnoid Hemorrhagic Stroke

- Blood leaks into subarachnoid space
- Results from ruptured berry aneurysm
- Family history

History

- **<u>Time last seen at baseline</u>**
  - **3 hour window important for TPA**
  - **When time of onset cannot be reliably ascertained then thrombolytics are contraindicated**
- Medications
- Headache
- Vertigo
- Trauma / Surgery
- Focal Neurological Deficits
  - Stroke Syndromes – symptoms correspond to area of brain effected

Differential Diagnosis

- Hypoglycemia
- Seizure disorder – Todd paralysis
- MI or CHF
- Panic Attacks, depression, conversion disorder
- Migraine
- Encephalopathy
- Air embolism
- Neoplasm
- Subdural / Epidural hematoma
- Multiple Sclerosis
- Medication effect/ toxidrome
- Bell Palsy
- Hyponatremia

Physical Exam

- Neurologic Exam
  - Assess level of consciousness
  - Glasgow Coma Score
  - Gross Motor Deficits
  - Speech abnormalities
  - Gait Disturbance
  - Facial Asymmetry
- Look for signs from etiology of stroke
  - Murmurs, or bruits
  - Orthostatic Hypotension, delayed capillary refill
- **Cincinnati Stroke Scale**
- **Los Angeles Stroke Scale**

Cincinnati Stroke Scale

Facial Droop: *Normal*: Both sides of face move equally
Abnormal: One side of face does not move at all

Cincinnati Stroke Scale

Arm Drift: *Normal*: Both arms move equally or not at all

Abnormal: One arm drifts compared to the other

Cincinnati Stroke Scale

- **Speech:**
  - *Normal*: Patient uses correct words with no slurring
  - *Abnormal*: Slurred or inappropriate words or mute

Los Angeles Stroke Scale

Screening Criteria	Yes	No
4. Age over 45 years	____	____
5. No prior history of seizure disorder	____	____
6. New onset of neurologic symptoms in last 24 hours	____	____
7. Patient was ambulatory at baseline (prior to event)	____	____
8. Blood glucose between 60 and 400	____	____

9. Exam: *look for obvious asymmetry*

	Normal	Right	Left
Facial smile / grimace:	☐	☐ Droop	☐ Droop
Grip:	☐	☐ Weak Grip ☐ No Grip	☐ Weak Grip ☐ No Grip
Arm weakness:	☐	☐ Drifts Down ☐ Falls Rapidly	☐ Drifts Down ☐ Falls Rapidly

Based on exam, patient has only unilateral (and not bilateral) weakness: Yes ☐ No ☐

10. If Yes (or unknown) to all items above LAPSS screening criteria met: Yes ☐ No ☐

11. If LAPSS criteria for stroke met, call receiving hospital with "CODE STROKE", if not then return to the appropriate treatment protocol. (Note: the patient may still be experiencing a stroke if even if LAPSS criteria are not met.)

Pre- Hospital Treatment

- Manage Airway –
  - GCS less than 8 intubate
  - Controlled ventilation to decrease intracranial pressure
- IV access
- Accu – check
  - Hyperglycemia may exacerbate ischemic insult
- Cardiac and pulse oximetry monitoring
- For Altered Mental Status may give naloxone and thiamine

Diagnostic Testing

- CT brain without contrast stroke protocol
  - Most ischemic strokes will not be visualized by routine CT for at least 6 hours
    - Way out of Golden Window for TPA use
  - Hypodensity indicating infarct should appear in 24 – 48 hrs

Diagnostic Testing

  - CT will identify almost all parenchymal hemorrhages greater than 1 cm
  - CT will identify up to 95% of subarachnoid hemorrhages if obtained within 12 hrs of symptom onset
- If SAH is suspected based on history and a negative CT is obtained it is prudent to perform a lumbar puncture

Treatment

- Control Seizure with Benzodiazepines
- Maintain blood pressure
  - Goal: Systolic Blood Pressure <180mmHg, Diastolic Blood Pressure < 110mmHg
- Thrombolytics
  - **Ischemic Stroke ONLY**
  - **<u>Administer within 4.5 hrs of symptom onset but preferably before 3 hrs</u>**
    - Importance of time last seen at baseline

Treatment

- Contraindications to Thrombolytics:
  - Any history of Intracranial Hemorrhage
  - Recent stroke or head trauma <3mo ago
  - Surgery <14 days ago
  - Systolic BP >185mmHg; diastolic BP>110mmHg
  - Bleeding diathesis
  - Non-compressible arterial puncture <7 days
  - MI <3mo ago
  - Anticoagulation: Use of heparin in 48hrs, INR >1.7, PT > 15 sec
  - Thrombocytopenia
  - Intracranial neoplasm
  - Seizure at stroke onset
  - Minor or rapidly improving symptoms
  - Pregnancy
  - Internal bleed <3 wks ago

Treatments

- If patient presents in the 3- 4.5 hr window after onset of symptoms there are additional exclusion criteria to receiving thrombolytics:
  - Age >80 yrs
  - Oral anticoagulant use
  - NIH – SS >25 or > 1/3 MCA territory
  - History of previous stroke or diabetes

- If patient receives TPA admit to ICU

Treatments

- Montior intracranial pressure and cerebral edema:
  - Elevate Head of bed to 30 degrees
  - Controlled ventillation to keep partial pressure of Carbon Dioxide 35-40mmHg
  - Consider use of Mannitol

*Urgent Neurosurgery Consult

Treaments

- Aspirin for all ischemic strokes
- Labetalol to control blood pressure
  - Avoid aggressive blood pressure correction to avoid risk of extending stroke due to hypoperfusion

CVA CQI Report

EMS Agency: ______________________

Title: Cerebral Vascular Accident CQI Report
Standard: Protocol Compliance and Education & Training for Providers
Reference: MCA protocol guidelines (Adult Treatment, Section 1-6)

Qualifying patient criteria for inclusion in audit is provider impression of "Stroke."

Total number of runs audited: ______________

	Performed	Percent
1. Blood glucose performed.		
2. Cincinnati Stroke Scale performed.		
3. Time last seen normal documented.		
4. Oxygen applied.		
5. Cardiac monitor applied.		
6. IV access attempted.		
7. Time on scene less than 10 minutes.		

Methods: Data collected through retrospective run review.

Screen for qualifying runs in 6-month time period. Audit sample not to exceed 25 patients.

Audit completed: ____________________ Summary Report date: __________________
Comments / Audit Exceptions:

Report completed by: ________________ Signature: ______________________________
Title: ______________________

Physician Director: __________________ Signature: ______________________________

CVA Recognition CQI Report

EMS Agency: ______________________

Title:	Cerebral Vascular Accident Recognition CQI Report
Standard:	Protocol Compliance and Education & Training for Providers
Reference:	MCA protocol guidelines (Adult Treatment, Section 1-6)

The purpose of this audit is to assess whether the need to screen for CVA is recognized in the field.

Methods: Data collected through retrospective run review.

Screen for qualifying runs (those with signs/symptoms as below) in 6-month time period. Identify whether Cincinnati Stroke Scale was used in assessment. Audit sample not to exceed 50 patients.

	Number Identified	Number CSS Performed	Percent
1. Unexplained change in mental status.			
2. Unexplained weakness, paralysis or lack of coordination.			
3. Unexplained slurring or difficulty with speech.			

Audit completed: __________________

Comments / Audit Exceptions:

Summary Report date: __________________

Report completed by: ________________

Title: ____________________

Signature: ___________________________

Physician Director: ________________

Signature: ___________________________

Cerebrovascular Accident (CVA, Stroke)

Pre-Medical Control

MFR/EMT/SPECIALIST/PARAMEDIC

1. Follow **General Pre-hospital Care Protocol.**

EMT/SPECIALIST/PARAMEDIC

2. Measure blood glucose
   A. If blood glucose less than 60 mg/dl treat per **Altered Mental Status Protocol**.

3. If seizure, follow **Seizure Protocol.**

4. Utilize the Cincinnati Pre-hospital Stroke Scale. Try to elicit the following signs:
   A. Facial droop (have patient show teeth or smile)
   B. Arm drift (have patient close eyes and hold both arms straight out for 10 seconds)
   C. Abnormal speech (have patient say the sky is blue in Michigan)

5. Document time last seen normal (for patient).

6. Minimize scene time and begin transport.

SPECIALIST/PARAMEDIC

7. Initiate vascular access.

PARAMEDIC

8. Monitor EKG. (**DO NOT** delay scene time for IV and EKG monitoring.)

EMT/SPECIALIST/PARAMEDIC

9. Make contact with destination hospital, notify as soon as possible.