

Cerebral Vascular Accident (CVA) "Brain attack or stroke"

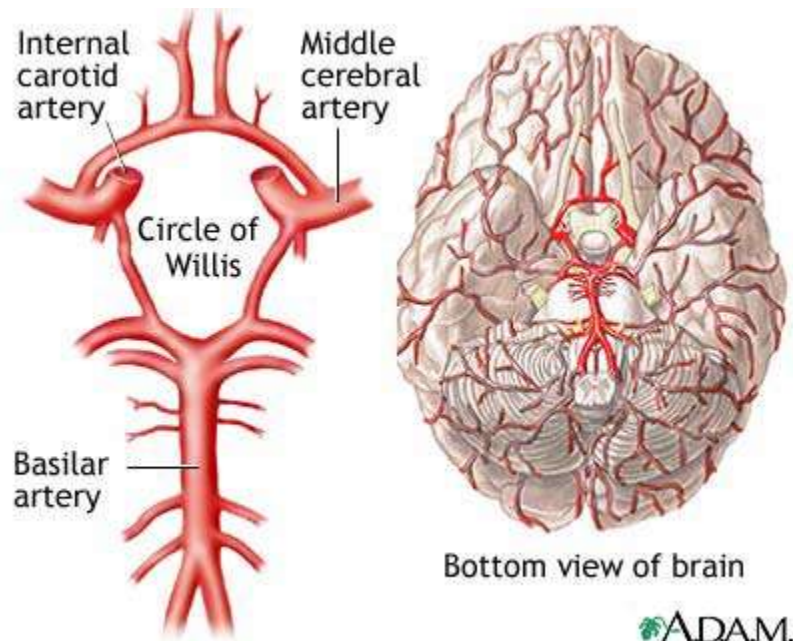
Key Points

- Third leading cause of death in North America
- Highest incidence is in people > 65 yrs of age
 - 28% occur in people under 65 years of age
- Familial predisposition is a risk factor
- More common in the African American, men more than women

Risk Factors

Hypertension	Blood sugar levels	Obesity	Hyperlipidemia	Atherosclerosis
Substance abuse	Sedentary lifestyle	Cardiac Disease Atrial Fib	Age	Oral Contraceptives

Definition: Syndrome in which gradual or rapid onset of neurological deficits occur as a result of decreased blood flow to a focal (localized) area of brain tissue. End result of stroke will vary according to the vessel and area of the brain involved, and the extent of involvement.



Pathophysiology:

CVA's are either ischemic or "dry strokes" (cerebral thrombosis, embolism) or hemorrhagic "wet strokes."

Neurological deficits that occur as result of a CVA can often be used to identify its location

Transient Ischemic Attack

*Risk of a stroke following a TIA is approximately 30% within 5 years!!

- Neurological deficit lasting less than 24 hours (often less than 10 minutes)
- Warning sign of ischemic thrombotic stroke
- Neuro deficits depend upon size of the vessel that is involved and the symptoms are usually of sudden onset
 - S/S weakness of hand, forearm, corner of mouth, aphasia, visual disturbances (blurring)

Thrombotic	Embolic
Platelet aggregation causing vessel occlusion	Traveling fragments (clots or clump of matter) from outside of brain lodge in vessels of the brain
Usually during sleep, when blood flow is low. Usually over 50 yrs of age	Usually occurs in younger, active client
Risk factors: atherosclerosis, Htn	Risk Factors: Cardiac disease (A-fib, flutter, rheumatic heart disease



Hemorrhagic CVA

Intracerebral hemorrhage (ICH)	Intraventricular hemorrhage (IVH)	Subarachnoid Hemorrhage (SAH)	Arteriovenous Malformation (AVM)
Hypertension Cocaine/Meth	Usually an extension of ICH	Ruptured aneurysm	Abnormal collection of vessels

- Occurs most often with cerebral vessel rupture in older adults who have poorly controlled, long term hypertension
- Sudden onset, usually associated with activity, most fatal
- Blood enters brain tissue, ventricles, or subarachnoid space
- Usually c/o “THE WORST” headache they have ever experienced

Stroke signs and symptoms

The particular type and degree of neurological deficits depend on the particular area of the brain involved. Knowing the vessel or the side of the brain is helpful. CVA causes contra lateral deficits.

Stroke Left Side of Brain

Right sided hemiplegia

- Expressive aphasia
- Receptive aphasia
- Global aphasia
- Slow cautious behavior
- Intellectual impairment

Stroke Right side of Brain

Left sided hemiplegia

- Spatial-perceptual deficit
- Impulsive behavior
- Appears unaware of deficit
- Poor judgment

Diagnostic Tests

ECG: Look for atrial fibrillation

Computed tomography (CT scan)

- Without contrast can determine the presence of hemorrhage, tumors, aneurysm, ischemia, edema, and tissue necrosis. Also can see shift of intracranial contents

Arteriography

- Demonstrates abnormal vessel structure, vasospasm, loss of vessel integrity, stenosis of carotids

Ultrasound Doppler

- Evaluates blood flow through the carotids

Magnetic resonance imaging (MRI)

- Conducted to detect shifting of brain tissues (hemorrhage and edema)
- Look at diffusion and perfusion

Magnetic resonance angiography

- Detects occlusive disease of large vessels

Positron emission tomography (PET scan)

- Detects size and location (specific but expensive)

Lumbar Puncture

- Blood in CSF may be seen in hemorrhagic

Treatment:

Pharmacological Agents

Thromolytic therapy (tPA): read the article and list contraindications for use.

Anticoagulants

- warfarin sodium, (Coumadin)

Antiplatelet

- Acetylsalicylic acid 50-325mg daily (ASA)
- Ticlopidine 250mg BID (Ticlid)
- clopidogrel bisulfate 75mg daily (Plavix)

Other:

- Calcium Channel blockers (Nimotop) for cerebral vasospasm
- Mannitol, Lasix for increased ICP
- Anticonvulsant (Dilantin)

Surgical Procedures

- Carotid Endarterectomy (CE)
- Mechanical Embolectomy
- Bypass of an occluded vessel
- Patients who are not candidates for CE may benefit from angioplasty and carotid stenting
- Gamma knife for AVM's

Save the penumbra

Area around the core of the infarct where there is decreased blood flow. However, there is potentially salvageable tissue. Need to reperfusion the core.

Immediate Nursing Care

1. ABCs! Monitor airway patency and respiratory status
 - O₂, side position, lung sounds, suction prn
2. Level of consciousness
 - Glasgow for changes
3. BP Management
 - Perfusion balanced with edema and hemorrhage
 - Current recommendations
 - Treat only SBP >220 mmHg or DBP >120 mmHg
 - Want to keep the MAP > 80
4. Monitor cardiac status
 - Dysrhythmias (bradycardia, PVC's, tachycardia, AV block)
5. Normothermia
 - Hyperthermia with affected hypothalamus
 - Hyperthermia increases metabolic demand and free radical generation, which kills more stunned cells in the penumbra
 - A one to two centigrade increase means a couple of infarct volume and risk of a poor prognosis
 - Small changes cause a big effect
6. Correct hypo or hyperglycemia
 - Hyperglycemia=bad outcomes
 - Cerebral toxicity
 - Disrupts the blood brain barrier, increasing the risk of hemorrhagic conversion
 - May be an early marker for more severe stroke
 - Hypoglycemia=cellular damage
 - Direct brain toxicity
 - Blood sugars 25-30 can cause cell death within one hour
 - Can transiently cause focal neurologic signs that mimic stroke
7. Maintain accurate I&O
 - CVA may damage pituitary gland (diabetes insipidus)
 - Be alarmed with large amount of clear urinary output
8. Monitor for seizures
 - May stem from damage or increased ICP

9. Prevent injury to affected side
 - Careful positioning, skin integrity, turn q 2 hours, ROM

Future

- Hypothermia
- Magnesium
- Desmoteplase
- Albumin
- Combination therapy
- Rehabilitation therapy

Patient Teaching

- Control of blood pressure below 140/90
- Control of diabetes (blood sugars within normal range)
- STOP smoking
- Limit alcohol
- Follow up lab work for cholesterol and hyperlipidemia
- Exercise and healthy eating program
- Hormone replacement in post menopausal women not recommended
- Medication compliance.