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# Exercise for People with Post Cerebral Vascular Accidents

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The Truth about Exercise and Cerebral  
Vascular Accidents

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# Purpose

- This session will focus on the issue of promoting functionality when caring for people who have had a Cerebral Vascular Accident. This seminar will integrate the principles from seminar 1 and apply it to people who have had a Cerebral Vascular Accident.
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# Learner's Objectives

- The learner will be able to:
  - Discuss the patho-physiology associated with Cerebral Vascular Accidents.
  - Identify the specific signs and symptoms associated with Cerebral Vascular Accidents.
  - Develop an understanding of how to look beyond the compensatory strategy of people who are post Cerebral Vascular Accidents and develop appropriate interventions
  - Demonstrate how to implement effective interventions in all therapeutic settings
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# Purpose of Exercise for the Person who are Post Cerebral Vascular Accidents

- To promote the optimal level of independence given their current ability level.
  - Functional mobility is any form of locomotion which enables the individual who is post Cerebral Vascular Accident to be as independent as possible while maintaining safety for the individual, and the caregivers.
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# Etiology: What is a Cerebral Vascular Accident

- A **stroke or Cerebral Vascular Accident** is the sudden death of brain cells due to a problem with the blood supply. When blood flow to the brain is impaired, oxygen and important nutrients cannot be delivered. The result is injury and then death to brain cells resulting in abnormal brain function. Blood flow to the brain can be disrupted by either a blockage or rupture of an artery to the brain.
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# Facts about Cerebral Vascular Accidents

- **Temporary Ischemic Attack (TIA)** when the symptoms are temporary (less than 24 hours), and a CVA is when the loss of brain function is permanent.
  - There are two major types of CVAs, **embolic or ischemic** and **hemorrhagic**.
  - Stroke by common usage usually refers to the more common embolic or ischemic stroke. These strokes occur from a blood clot that occurs inside the vessel and prevents blood flow to brain.
  - Besides the development of atherosclerotic plaque and high blood pressure, other factors increasing the risk of stroke include smoking, diabetes, leukemia, anemia, brain tumors, gout and birth control pills.
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# Facts about Cerebral Vascular Accidents

- In the United States, about 400,000 people a year suffer from strokes. Forty percent of these strokes may be fatal, but the 60% that survive require therapeutic interventions to resume some semblance of their previous lifestyle.
  - The cost of strokes is not just measured in the billions of dollars lost in work, hospitalization and the care of survivors in nursing homes.
  - The major cost or impact of a stroke is the loss of an independent lifestyle that occurs in 30% of the survivors.
  - After a stroke, a survivor may lose some aspect of the ability to effectively walk, feed or express themselves.
  - The family members find themselves in a new role as caregivers: it is a true tragedy. What makes this event even more heartbreaking is that it never had to happen in the first place.
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# Risk Factors Associated with Cerebral Vascular Accidents

- Cigarette smoking
  - Too much alcohol increases the risk of a stroke. The recommended 'safe' limits for alcohol consumption are 21 units each week for women and 21 for men.
  - Age
  - In most age groups except older adults, stroke is more common in men than in women. However, it kills more women than men, regardless of ethnic group. Women are at a higher risk for hemorrhagic CVAs.
  - Drug use
  - Obesity
  - Diabetes
  - High blood pressure, and
  - Increased Cholesterol Levels.
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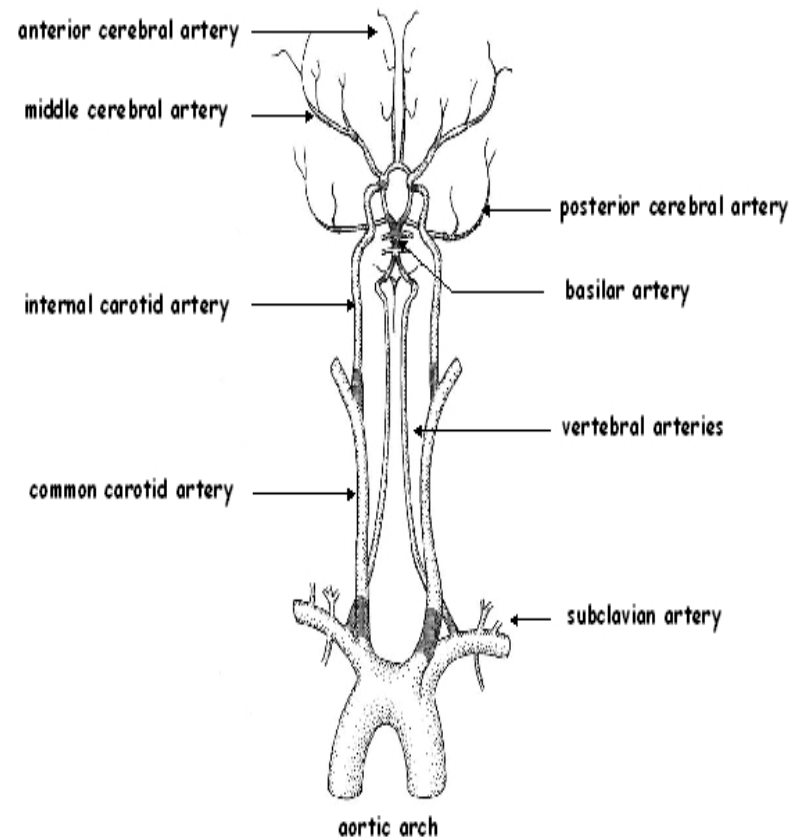
# Etiology: Where does a Cerebral Vascular Accident occur and its effects

- Left side
  - Receptive/Expressive Aphasia
  - Dysarthria
  - Hemi-anopsia -Right
  - Sensory Loss –Right
  - Right side motor loss
  - No Apraxia
  - Emotional Lability
  - Cautious
  - Difficulty processing new language information
  - Right Side
  - Dysarthria
  - Sensory loss left
  - Hemi-anopsia-Left
  - Decreased awareness of left side
  - Depth perception limitations
  - Left sided motor loss
  - Apraxic
  - Impaired judgment
  - Impulsive
  - Difficulty with New Spacial learning
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# Etiology: Blood Supply and Cerebral Vascular Accidents

- **Internal carotid artery occlusion**

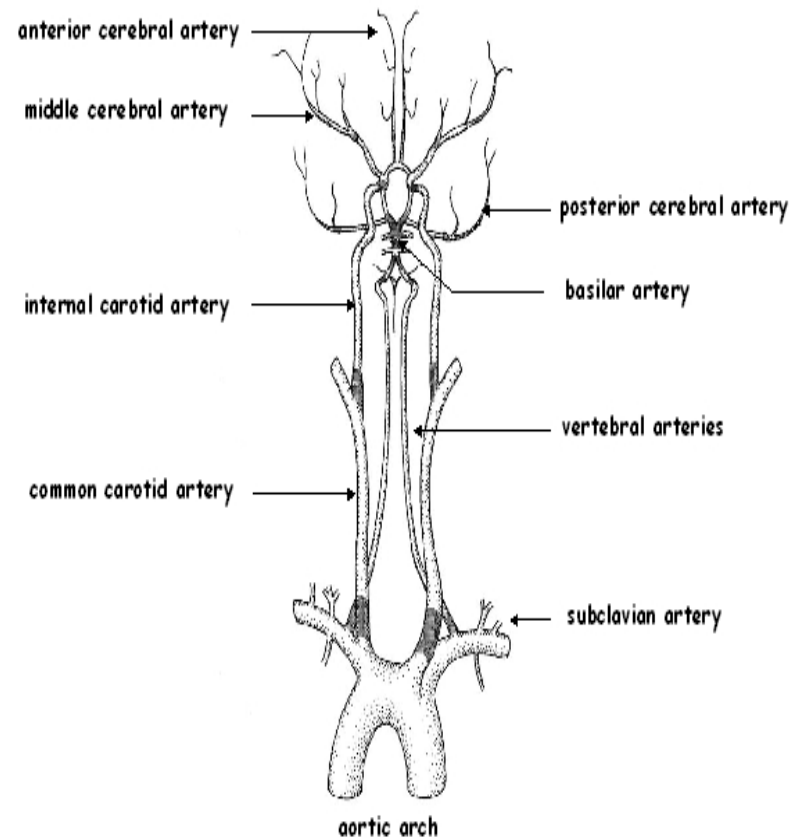
**Sx:** contralateral weakness or numbness, dysphasia, apraxia, confusion if the dominant hemisphere is involve. Transient blurring of vision or ipsilateral blindness, homonymous visual field loss, ipsilateral headache.



# Etiology: Blood Supply and Cerebral Vascular Accidents

- **Anterior cerebral artery occlusion**

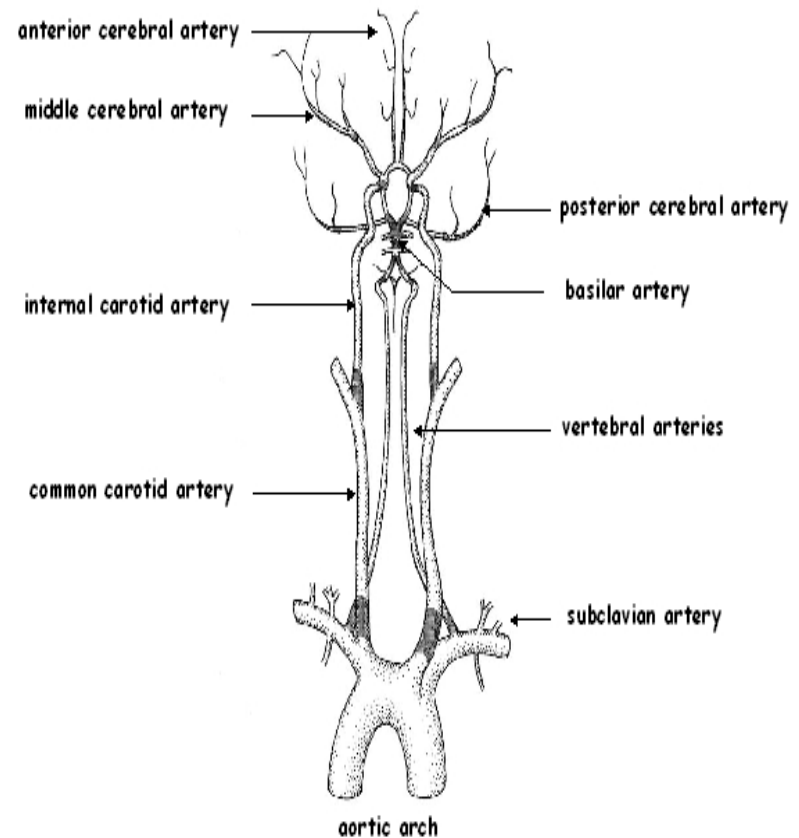
**Sx:** paralysis of opposite foot & leg, paresis of opposite arm, urinary incontinentce, mental impairment, slowness, delay, lack of spontaneity, impairment of gait & stance (apraxia), cortical sensory loss over toes, foot, & leg.



# Etiology: Blood Supply and Cerebral Vascular Accidents

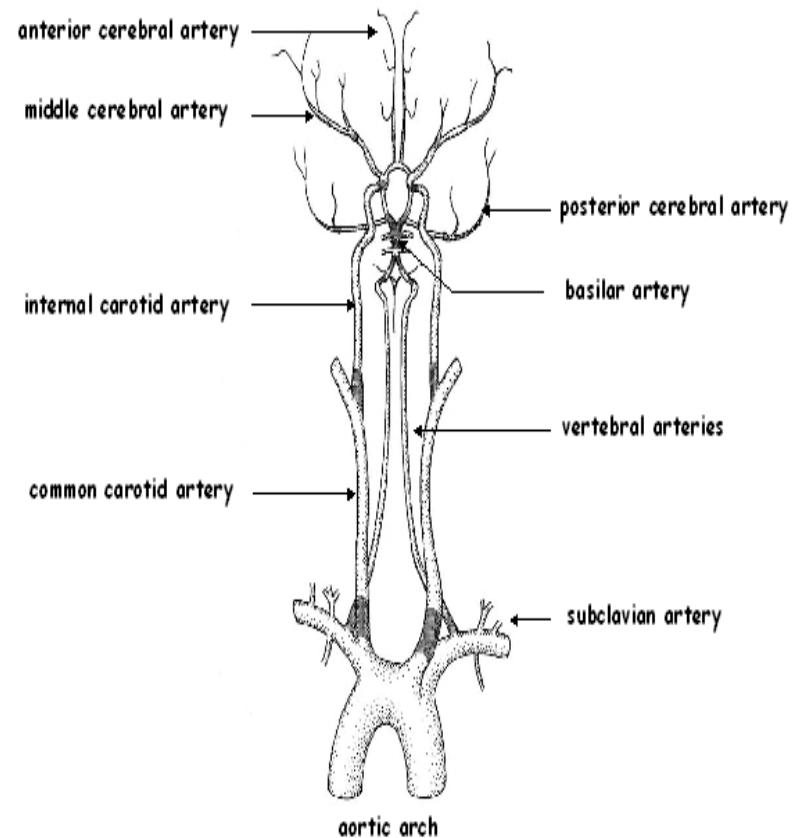
## ■ Middle cerebral artery occlusion

**Sx:** paralysis & sensory impairment of contralateral face, arm & leg; aphasia in left CVA, paralysis of conjugate gaze to the opposite site; homonymous hemianopia (often superior homonymous quadrantanopia); Cheyne-Stokes respiration; pure motor hemiplegia in internal capsule posterior limb CVA; ataxia of contralateral limb in parietal lobe involvement;



# Etiology: Blood Supply and Cerebral Vascular Accidents

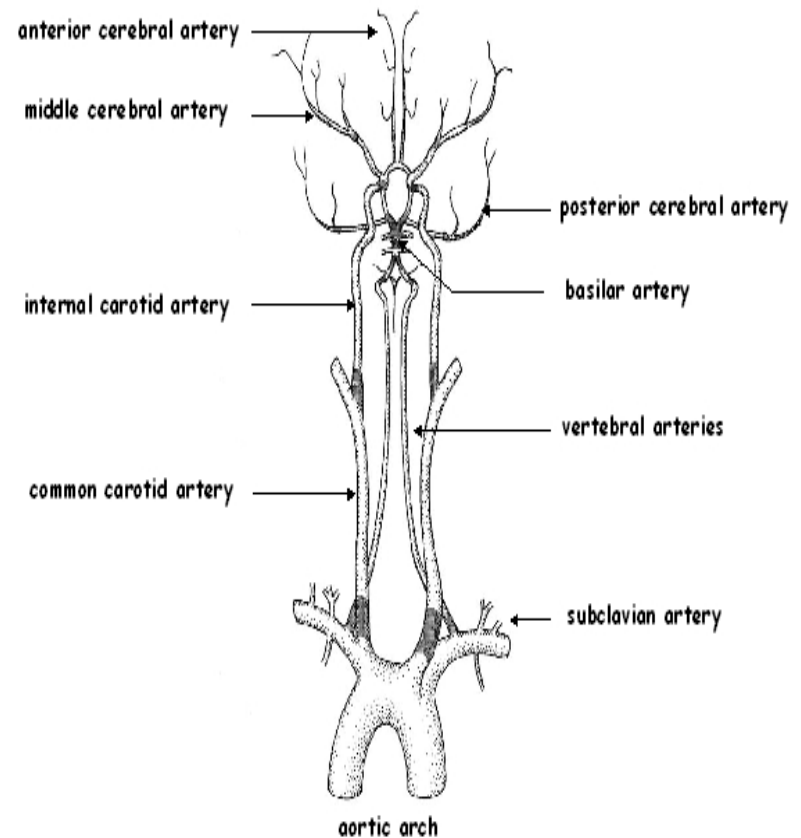
- **Sx of Upper division occlusion:** hemiparesis & sensory loss, arm & face affected more than leg; Broca's aphasia, hemineglect.
- **Sx of Lower division occlusion:** Wenicke's aphasia or nondominant behavior disorder without hemiparesis;
- **Sx of Penetrating Artery occlusion:** pure motor hemiparesis



# Etiology: Blood Supply and Cerebral Vascular Accidents

## ■ Posterior cerebral artery occlusion

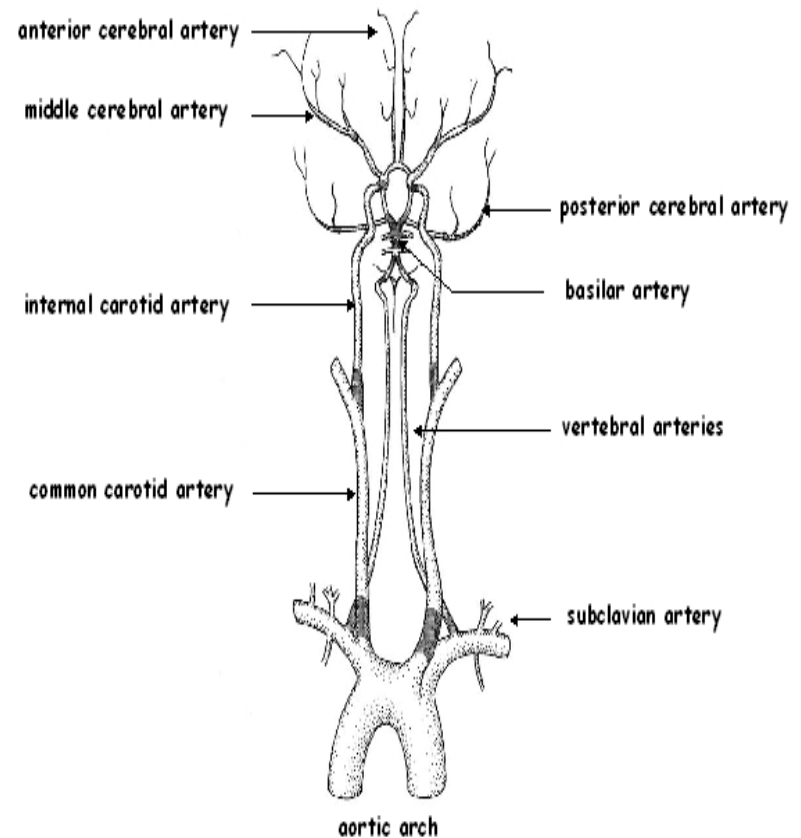
**Sx:** homonymous hemianopia of bilateral homonymous hemianopia; cortical blindness; memory defect, dyslexia without agraphia, topographic disorientation, unformed visual hallucination.



# Etiology: Blood Supply and Cerebral Vascular Accidents

- **Thalamic syndrome:** sensory loss, spontaneous pain & dysesthesias, choreoathetosis, intentional tremor, mild hemiparesis.

- **Thalamoperforate syndrome:** 1. Superior, crossed cerebellar ataxia. 2. Inferior, crossed cerebellar ataxia with ipsilateral 3rd nerve palsy.

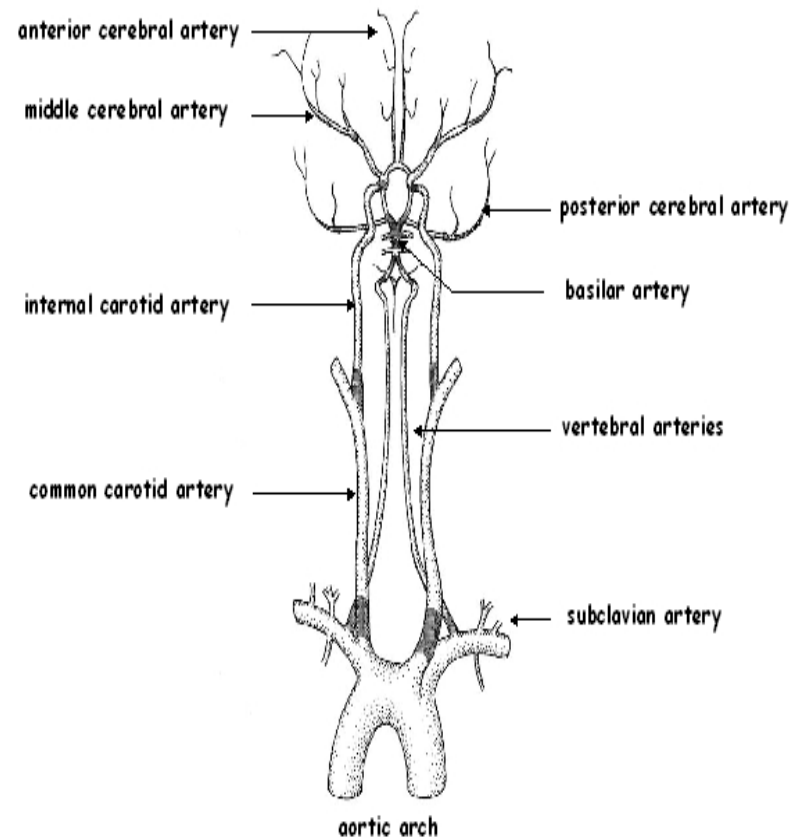


# Etiology: Blood Supply and Cerebral Vascular Accidents

■ **Weber syndrome:** 3rd nerve palsy & contralateral hemiplegia.  
Paralysis or paresis of vertical eye movement, skew deviation, sluggish pupillary light response, slight miosis & ptosis; Contralateral ataxic or postural tremor; Decerebrate attacks;

**Midbrain syndrome:** oculomotor palsy & other movement abnormalities.

**Bilateral inferior temporal lobe:** amnesia.





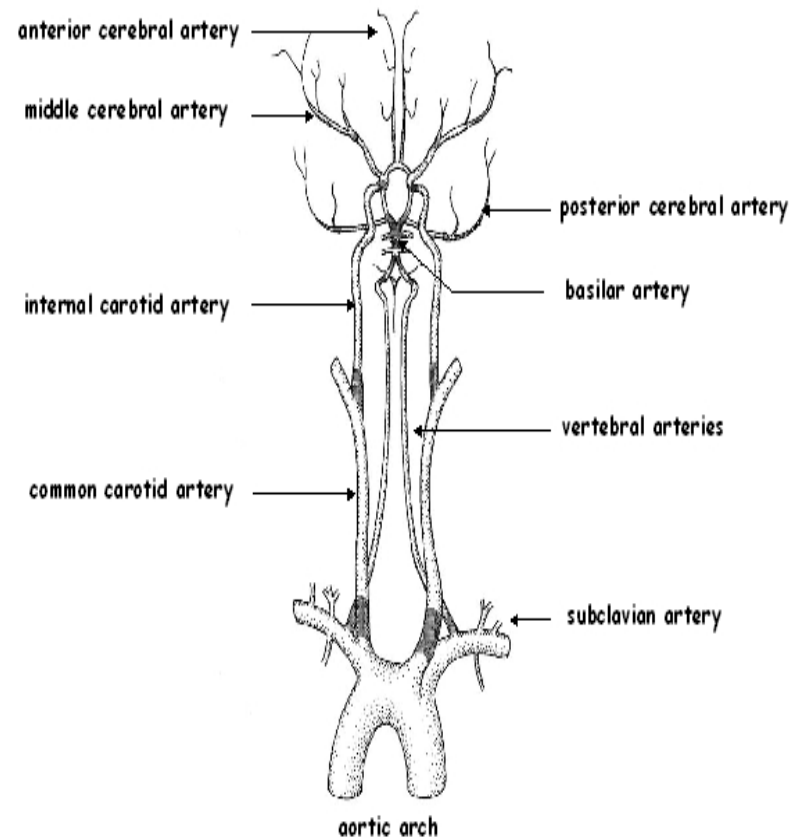
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# Key Concepts when Treating People with a Cerebral Vascular Accident

- The primary objective for treating people with a CVA is promoting functional mobility and independence.
  - Rather than teaching them something new have them tap into old motor learning plans in an effort to keep them safe.
  - There is a relationship between energy conservation and endurance training.
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# Etiology: Blood Supply and Cerebral Vascular Accidents

- **Subthalamic nucleus:** hemiballism
  - superior cerebellar artery occlusion
  - vertebral artery occlusion
- **-Posterior inferior cerebellar artery occlusion (lateral medullary syndrome)**  
Occlusion of vertebral artery or lower branch of basilar artery.  
One side of lesion: paralysis with atrophy of half the tongue.  
On opposite side of lesion: paralysis of arm & leg, spare the face, impaired tactile & proprioceptive sense over half of othe body.



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# Key Points about Balance

- Balance get stronger when it is used
  - Balance is a product of control at various parts of your body
    - feet
    - knees
    - hips
    - trunk
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# Cerebral Vascular Accident and Balance

- Treatment approaches about people with a CVA are counterintuitive
  - People with CVA who exercise should seek more difficult programs despite the progression of the disease (within reason)
  - People with CVA have a decrease in their balance reactions due to the following reasons
    - their center of gravity is a fixed target
    - they are avoiding in motion this decreases the demands on their body
    - Their protective reactions are diminished due to their ever-changing rigid body position
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## Early Stage

- The person with a CVA is just recently diagnosed the person's regime should include training to relearn all previous life tasks.
  - At this point rigorous therapeutic interventions should be a component of one's schedule it is time to reassess the program to assure there is balance between energy conservation and endurance training. The program should consist of functional mobility, balance and muscle control.
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# Middle Stages

- At this junction, it is over a year post CVA.
  - It is critical that people with CVA keep moving. There should be time set aside to assure adequate rest, to allow for prolonged mobility skills.
  - People who are in the middle stage of CVA can be categorized as
    - independent ambulatory,
    - ambulatory with supervision
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# Middle stage

- Regardless of the person's ambulatory status, there are times when the person with a CVA can ambulate safely.
  - The person life skills should be assessed to determine what aspect of self care and functional mobility skills can be reintegrated back into their life given the functional abilities and environmental factors.
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# Middle Stage

- The signs and symptoms can progress due to external factors such as self imposed compensatory strategies.
  - The person with the CVA should continue to be as active as possible.
  - Exercise needs to continue and continue to promote, balance, cardiovascular strength, and control of muscle movements.
  - The intensity may be less than previously, but work within their abilities.
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# Independent Ambulatory

- Assistive devices may or may not help with this stage due to the fact that they detract the body from maintaining proper alignment.
- Always Strive for the least restrictive as possible.
- People who are in this stage need to do the following:
  - exercise daily, i.e. strengthening exercises
  - walk
  - engage in meaningful activities i.e.. dressing and bathing themselves, and tying shoes.

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# Independent Ambulator

- Independent ambulators are people who are able to ambulate safely despite how their gait pattern may appear. Be mindful that inefficient gait patterns may be the source of energy wasting and fatigue.
  - It is critical that people with a CVA ambulate for as long as possible. The person with a CVA is losing flexibility and these changes decrease their balance reactions. Thus in order for them to maintain strong protective reactions to prevent them from falling they need to ambulate.
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# Ambulators with Supervision

- Ambulators with supervision are people who are able to ambulate semi-safely but require that someone be nearby or next to them in case they should fall.
  - It is critical that people with a CVA ambulate for as long as possible. The person in this stage is in danger of losing their balance reactions if they are not utilized. It is important for them to maintain their current protective reaction. It is recommended that someone walk with them to prevent them from injury when they ambulate.
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# Ambulators with Supervision

- Assistive devices do typically help with this stage due to the fact that they are not able to sustain their energy levels and the device is a mechanism of energy conservation. Least restrictive is always recommended
- People who are in this stage need to do the following:
  - exercise daily, i.e.... strengthening exercises, range of motion
  - walk at set times i.e.... meals, bathroom, prearranged times
  - engage in meaningful activities i.e.... volunteering, bathing and dressing tying shoes, visiting with others, hobbies and crafts.

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# Late Stage

- People are mostly confined to a bed.
  - This does not mean that they do not need exercise or physical activity. The contrary is true.
  - They need to be involved as much as possible so that they do not develop secondary complications (i.e. bedsores or pneumonia)
  - Non-ambulators are people who are unable to ambulate.
  - Due to this fact that it is critical that people with a CVA obtain proper positioning and bed care. The person in this stage is in danger of pressure ulcers (bed sores). Thus in order for them to maintain their skin integrity it is recommended that they sleep on a alternating air mattress.
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# Late Stage

- People at this stage are generally non ambulators
  - People who are in this stage need to do the following:
  - exercise daily, i.e....., range of motion once per shift, breathing program
  - to be placed and positioned in a reclining chair so that they can see people outside of their room.
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# Video Case Studies

- Case One: 74 yr old man
  - Case Two: 67 year old man
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# Problem Solving Session

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# How to contact Stu

- Please feel free to contact me at 1-810-923-8970 or [blattstu@msu.edu](mailto:blattstu@msu.edu).
  - If you have questions or comments, I am always willing to talk and to gain greater insight into matters regarding caring for people who are post CVA.
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