Lecture# 5
semester# 1

Stroke

:by
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4th Class
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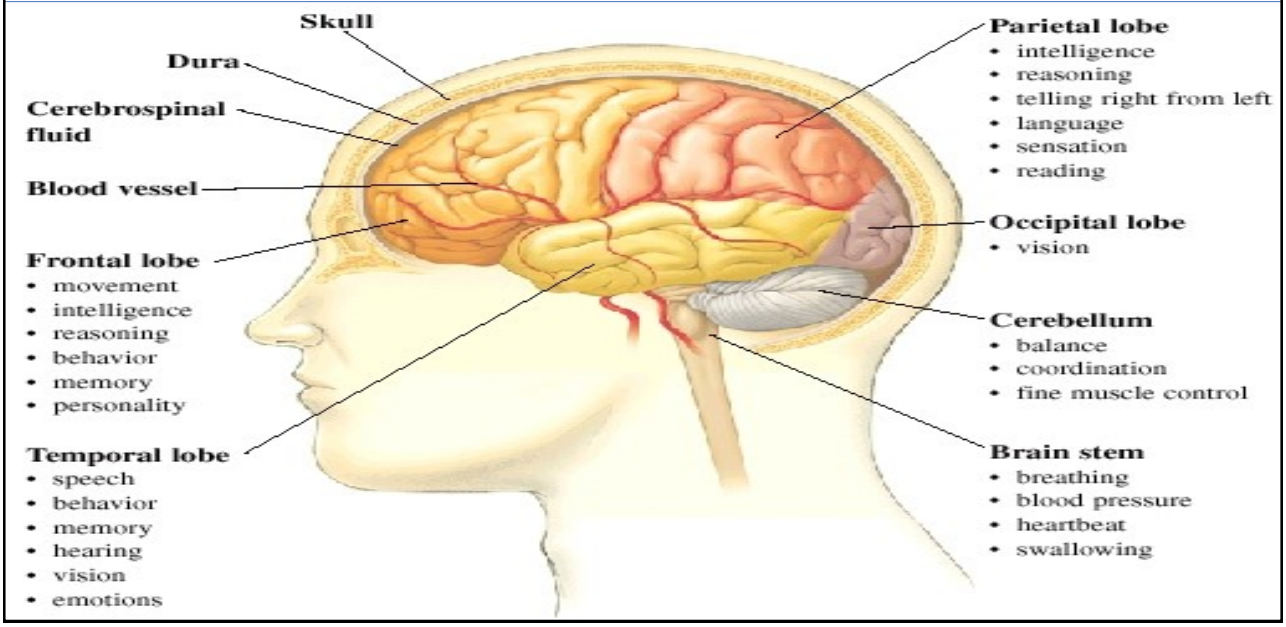
Diagram about the Brain



Cerebrovascular Disorder

❑**Cerebrovascular disorder** is an umbrella term that refers **to a functional abnormality** of the central nervous system (CNS) that occurs when the **blood supply to the brain is disrupted.**

✓ **Stroke** is the primary cerebrovascular disorder in the United States, and while it dropped from the fourth to the fifth leading cause of death, it is still a leading cause of serious, long-term disability.

✓Strokes can be divided into **two major categories**: **ischemic** (approximately 87%), in which vascular occlusion and significant hypoperfusion occur, and **hemorrhagic** (approximately 13%), in which there is extravasation of blood into the brain or subarachnoid space.

TABLE 62-1 Comparison of Major Types of Stroke

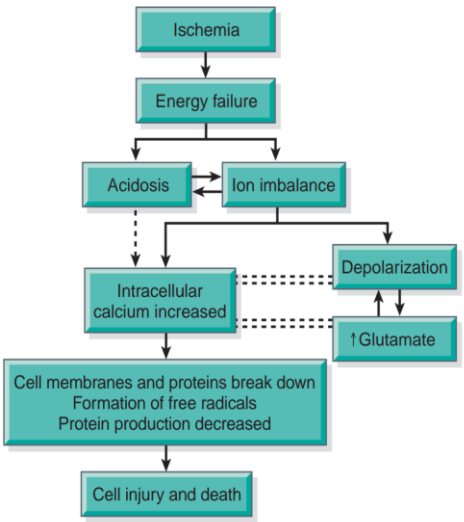
Types of Stroke	Causes	Main Presenting Symptoms	Functional Recovery
Ischemic	• Large artery thrombosis • Small penetrating artery thrombosis • Cardiogenic embolic • Cryptogenic (no known cause) • Other	• Numbness or weakness of the face, arm, or leg, especially on one side of the body, aphasia, vision loss (homonymous hemianopsia)	Majority of recovery made in the first 3–6 mo, slower steps toward recovery may be made up to 1 yr and beyond with therapy.
Hemorrhagic	• Intracerebral hemorrhage • Subarachnoid hemorrhage • Cerebral aneurysm • Arteriovenous malformation	• "Worst headache of my life" • Decreased level of consciousness • Seizure	Slower recovery, typically left with more disability.

Ischemic Stroke

- An ischemic stroke, **formerly referred to** as a **cerebrovascular accident** or "**brain attack**," is a sudden loss of function resulting from **disruption of the blood supply to a part of the brain**.
  - The only U.S. Food and Drug Administration (FDA)-approved thrombolytic therapy has a treatment window **of 3 hours after the onset** of a stroke, and scientific statements have endorsed its expanded use for up to **4.5 hours.**
- Although the time frame for treatment has expanded, urgency is needed on the part of the public and health care practitioners for **rapid transport** of the patient to a hospital for assessment and administration of the medication.

Pathophysiology of Ischemic Stroke

- In an ischemic brain attack, there is disruption of the cerebral blood flow **due to obstruction** of a blood vessel. This disruption in blood flow initiates a complex series of cellular metabolic events referred to as the ischemic cascade.



Causes of Ischemic stroke

- Large artery thrombosis.
- Small penetrating artery thrombosis.
- Cardiogenic embolic.
- Cryptogenic (Unknown cause).

Hemorrhagic strokes

primarily caused by:

- ✓**Intracerebral hemorrhage**(10%)
- ✓**Subarachnoid hemorrhage** (3%)
- ✓They're caused by bleeding into the **brain tissue**, the **ventricles**, or the **subarachnoid space**.
- ✓Primary intracerebral hemorrhage **from** a spontaneous rupture of small vessels accounts for approximately 80% of hemorrhagic strokes and is caused chiefly by uncontrolled hypertension.
- ✓Subarachnoid hemorrhage **results from** a ruptured intracranial aneurysm

Pathophysiology of Hemorrhagic Strokes

The pathophysiology of hemorrhagic stroke **depends on the cause** and **underlying type** of cerebrovascular disorder. Symptoms are produced when a **primary hemorrhage** occur.

Normal brain metabolism is disrupted **by the brain's exposure to blood**; by an **increase in ICP** resulting from the sudden entry of blood into the subarachnoid space, which **compresses** and **injures** brain tissue; or by **secondary ischemia** of the brain resulting from the **reduced perfusion pressure** and **vasospasm** that frequently accompany subarachnoid hemorrhage.

Transient Ischemic Attack (TIA)

- A neurologic deficit typically lasting **less than 1 hour**. A (TIA) is manifested by a sudden loss of motor, sensory, or visual function. The symptoms result from temporary ischemia (impairment of blood flow) to a specific region of the brain but when brain imaging is performed there is no evidence of ischemia.
- A (TIA) may serve as a warning of impending stroke. Lack of evaluation and treatment of a patient who has experienced previous TIAs may result in a stroke and irreversible deficits

Risk Factors for Stroke

- Hypertension (the major risk factor and control on it is the key to preventing stroke)
- Atrial fibrillation
- Hyperlipidemia and Obesity
- Diabetes mellitus
- Smoking
- Asymptomatic carotid stenosis
- Excessive alcohol consumption
- People older than 55 years of age

Clinical Manifestations of Stroke

- The patient with (CVA) may present with any of the following signs or symptoms:

✓Numbness or weakness of the face, arm, or leg, especially on one side of the body.

✓Confusion or change in mental status.

✓Trouble speaking or understanding speech.

✓Visual disturbances.

✓Difficulty walking, dizziness, or loss of balance or coordination.

✓Sudden severe headache.

Neurologic Deficits of Stroke

A- Visual Field Deficits:

1- Homonymous hemianopsia (loss of half of the visual field).

2- Loss of peripheral vision (Difficulty seeing at night and unaware of objects or the borders of objects).

3- Diplopia

B- Motor Deficits

1- **Hemiparesis**: Weakness of the face, arm, and leg on the same side (due to a lesion in the opposite hemisphere).

2- **Hemiplegia:** Paralysis of the face, arm, and leg on the same side (due to a lesion in the opposite hemisphere).

3- **Ataxia:** Staggering, unsteady gait and unable to keep feet together; needs a broad base to stand

4- **Dysarthria**: Difficulty in forming words

5- **Dysphagia:** Difficulty in swallowing

Cont.

C- Sensory Deficits

1- Paresthesia (occurs on the side opposite the lesion):

- Numbness and tingling of extremity
- Difficulty with proprioception

D- Verbal Deficits

1- Expressive aphasia: Unable to form words that are understandable; may be able to speak in single-word responses.

2- Receptive aphasia: Unable to comprehend the spoken word; can speak but may not make sense.

3- Global (mixed) aphasia: Combination of both receptive and expressive aphasia.

Cont.

E- Cognitive Deficits

- Short- and long-term memory loss
- Decreased attention span
- Impaired ability to concentrate
- Poor abstract reasoning
- Altered judgment

F- Emotional Deficits

- Loss of self-control
- Emotional liability
- Decreased tolerance to stressful situations
- Depression
- Withdrawal
- Fear, hostility, and anger
- Feelings of isolation

Diagnostic Findings

- History and a complete physical and neurologic examination. Initial assessment focuses on **airway patency**, which may be compromised by **loss of gag or cough reflexes** and altered respiratory pattern; cardiovascular status (including blood pressure, cardiac rhythm and rate, carotid bruit); and gross neurologic deficits.
- A non-contrast computed tomography (CT) scan to determine if the event is ischemic or hemorrhagic (the category of stroke determines treatment).
- Electrocardiogram (ECG) and a carotid ultrasound are standard tests.
- Other studies may include CT angiography or magnetic resonance imaging (MRI) of the brain and neck vessels and echocardiography.

Medical Management

- Patients who have experienced a TIA or stroke should have medical management for secondary prevention such as **Anticoagulants**, **Platelet-inhibiting medications**.
- **Avoid increased ICP**: Management of increased ICP includes osmotic diuretics (Mannitol), maintenance of PaCO2 at 30-35 mmHg, and positioning to avoid hypoxia through elevation of the head of the bed.
- Endotracheal Tube to maintain patent airway.
- Neurologic assessment to determine a complications are developing.
- Surgical procedure may done to treat the disease such as (Carotid endarterectomy), and also other surgical procedure may performed to repair any damage in blood vessels

Nursing Diagnosis

- Impaired Physical Mobility related to weakness and paresthesia manifested by Inability to purposefully move within the physical environment.
- Self-Care Deficit related to neuromuscular impairment manifested by inability to perform ADLs
- Impaired swallowing
- Impaired urination associated with flaccid bladder, detrusor instability, confusion, or difficulty in communicating
- Impaired verbal communication associated with brain damage

Nursing Management

- ✓Change patient position frequently to prevent bed sore.
- ✓Apply a splint at night to prevent flexion of affected extremity and prevent adduction of the affected shoulder with a pillow placed in the axilla.
- ✓Check body vital signs.
- ✓Given medications according physician prescription.
- ✓Encourage personal hygiene activities as soon as the patient can sit up; select suitable self-care activities that can be carried out with one hand.
- ✓Provide full range of motion four or five times a day to maintain joint mobility.
- ✓Start an active rehabilitation program when consciousness returns (and all evidence of bleeding is gone, when indicated).

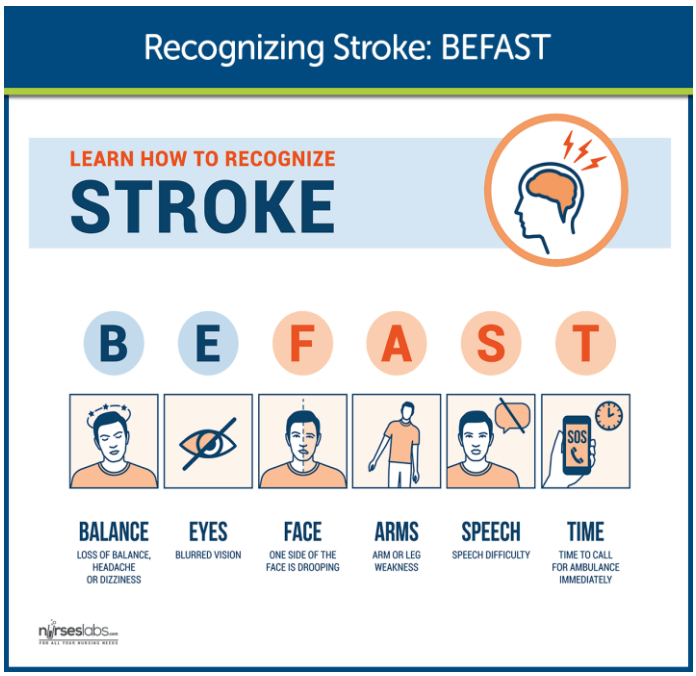


Figure 62-3 Correct positioning to prevent shoulder adduction.

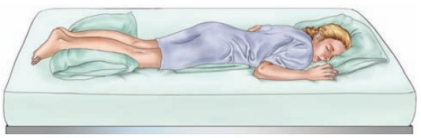


Figure 62-4 Prone position with pillow support helps prevent hip flexion.