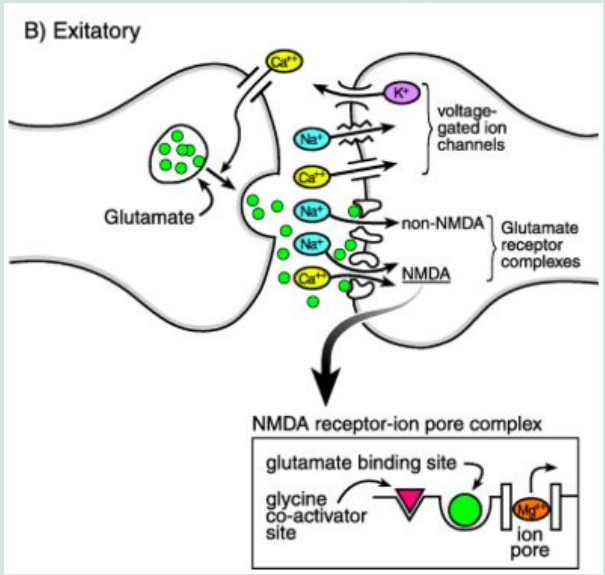
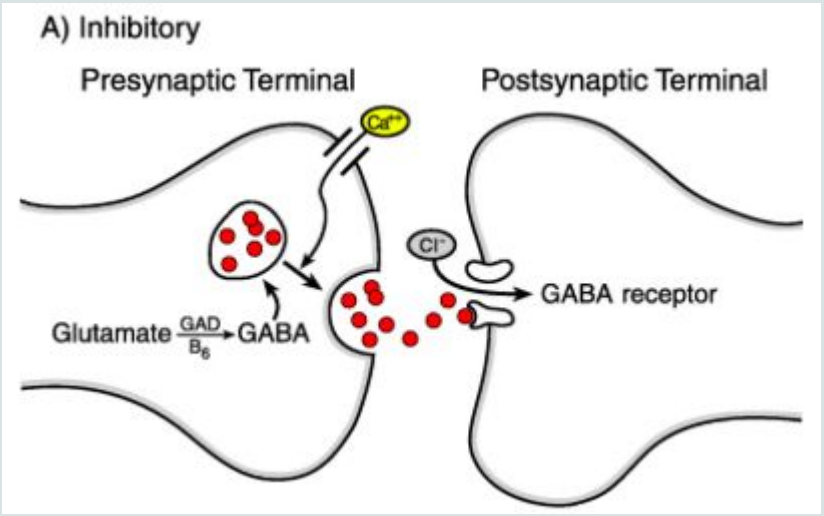
Neurology

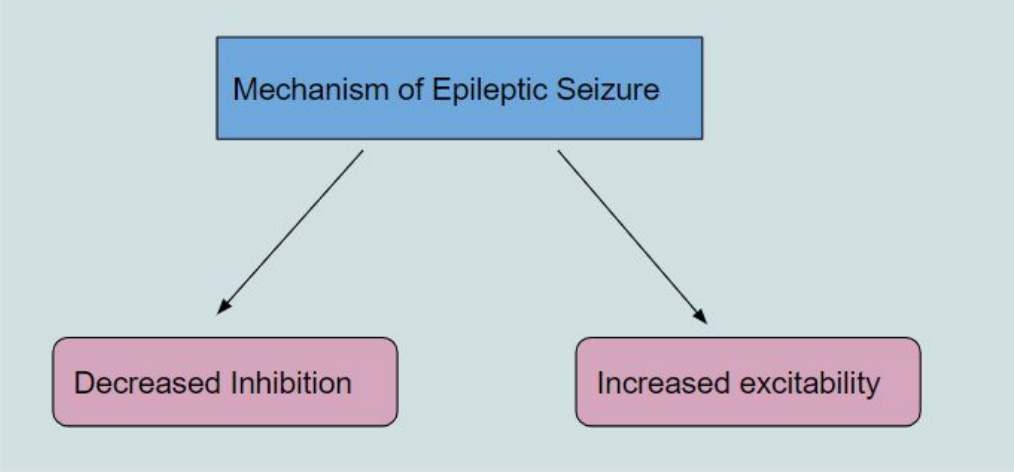
Stroke

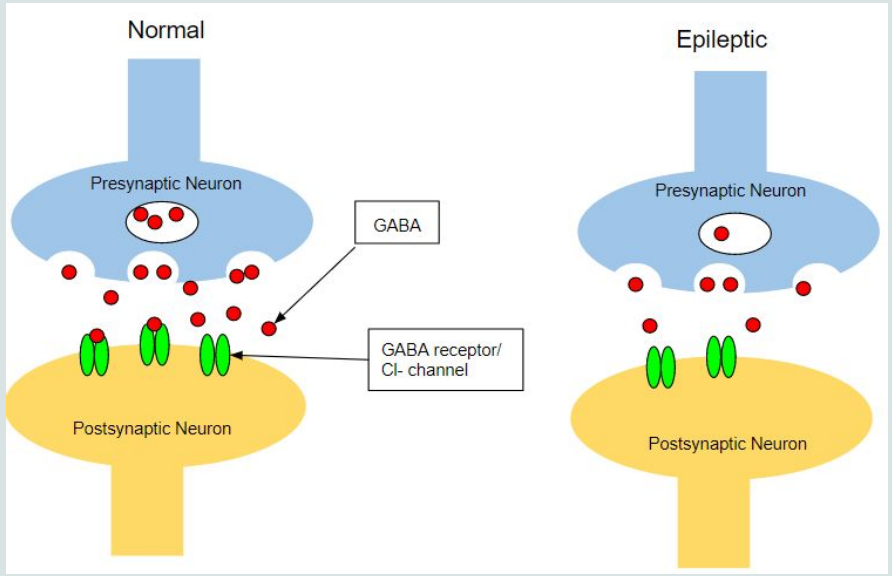
Epilepsy

Seizure


B) Exitatory
Ca++
K+
voltage-gated ion channels
Na+
Ca++
Glutamate
Na+
non-NMDA
Glutamate receptor complexes
Na+
NMDA
Ca++
NMDA receptor-ion pore complex
glutamate binding site
glycine co-activator site
Mg++
ion pore


A) Inhibitory
Presynaptic Terminal
Postsynaptic Terminal
Ca++
Cl-
GABA receptor
Glutamate
GAD
B6
GABA


Mechanism of Epileptic Seizure
Decreased Inhibition
Increased excitability


Normal
Epileptic
Presynaptic Neuron
GABA
GABA receptor/
Cl- channel
Postsynaptic Neuron
Presynaptic Neuron
Postsynaptic Neuron

Seizure and epilepsy

Seizure

An acute, transient neurological event caused by abnormal electrical discharge within the brain

Epilepsy

Syndrome or recurrent, unprovoked seizures

Status epilepticus

Seizure activity that fails to terminate within the anticipated time period or it refers to a series of consecutive seizures without recovery in between them

Causes of seizure

- Vascular
- Infection
- Trauma
- Autoimmune
- Metabolic
- Ingestion/withdrawal
- Neoplasm
- pSych

Type of seizure

- General vs Partial(focal)
- Complex vs Simple

- Atonic
- Myoclonic
- Absence
- Trigeminal neuralgia

Epilepsy

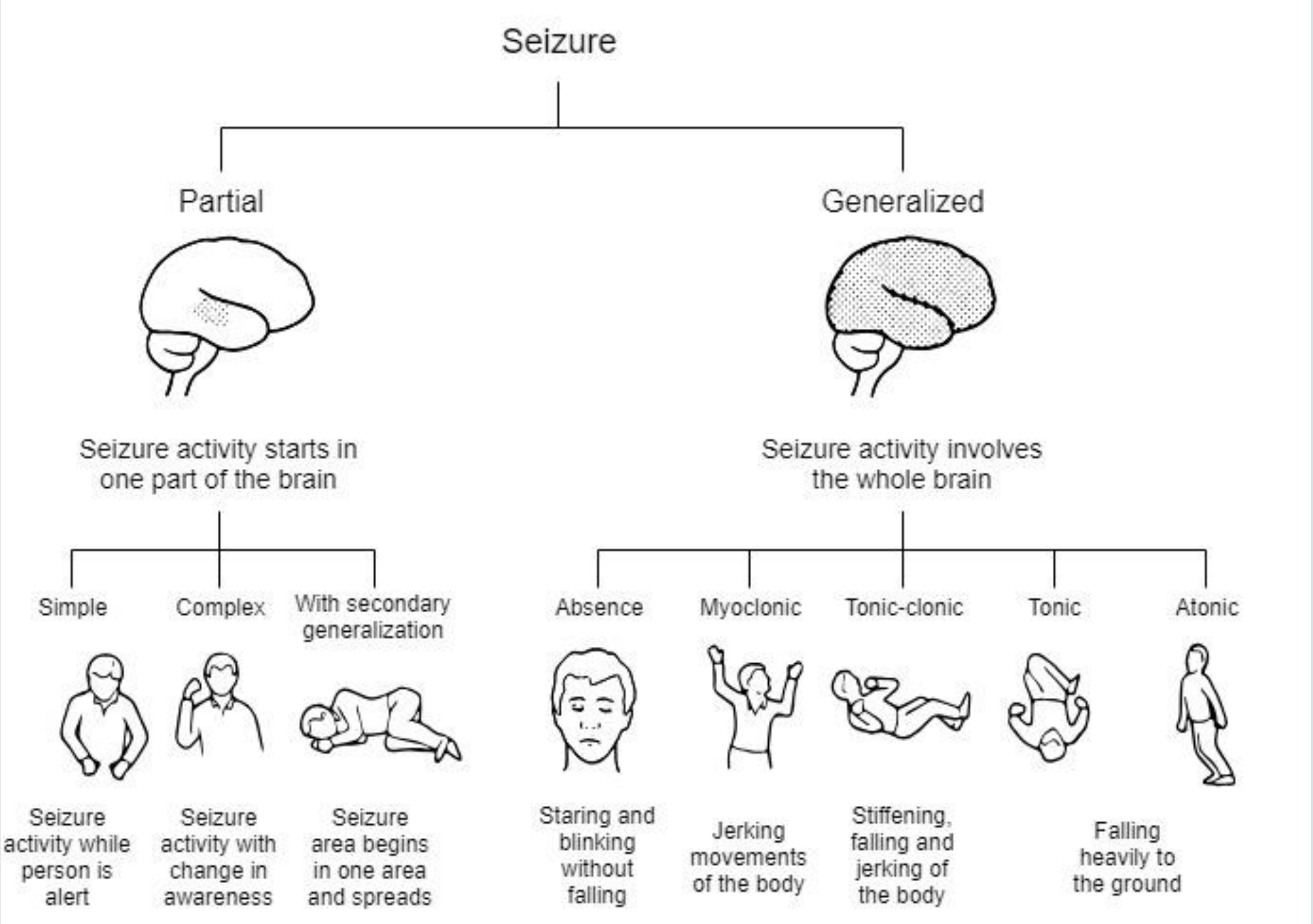
SIMPLE

- Small area of the brain
- Strange sensation
- Jerking movements
- Jacksonian march
- Often remember

COMPLEX

- Loss consciousness
- Impaired awareness and responsiveness
- Not remember

Epilepsy


Seizure
Partial
Generalized
Seizure activity starts in one part of the brain
Seizure activity involves the whole brain
Simple
Complex
With secondary generalization
Absence
Myoclonic
Tonic-clonic
Tonic
Atonic
Seizure activity while person is alert
Seizure activity with change in awareness
Seizure area begins in one area and spreads
Staring and blinking without falling
Jerking movements of the body
Stiffening, falling and jerking of the body
Falling heavily to the ground

Epilepsy

Stages

- Prodromal

  When symptoms start to appear prior to the big event

  - Aura

  Does not happen with all types

  Focal seizures or tonic-clonic types

- Ictus

  Actual seizure 1-3 min

  Greater >5 min or back-to-back

  Status Epilepticus

- Post Ictus/Postictal state

  After the seizure

  Takes hours to days

  Todds paralysis

Status epilepticus

Seizure lasts more than 5 min

Ongoing or without returning to normal

Usually tonic-clonic

Treatment: ***benzodiazepines***

(enhance GABA)

Epilepsy

Diagnosis

- Symptoms
- Medical history
- EEG
- Genetic testing
- Brain imaging: MRI, CT

Treatment

- Daily medications

  Anticonvulsants

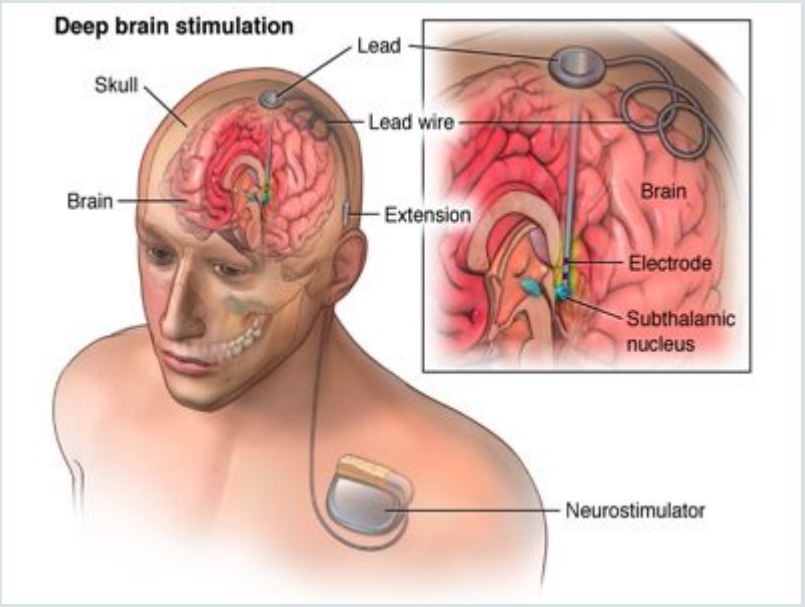
- Epilepsy surgery

  Remove cause of problem

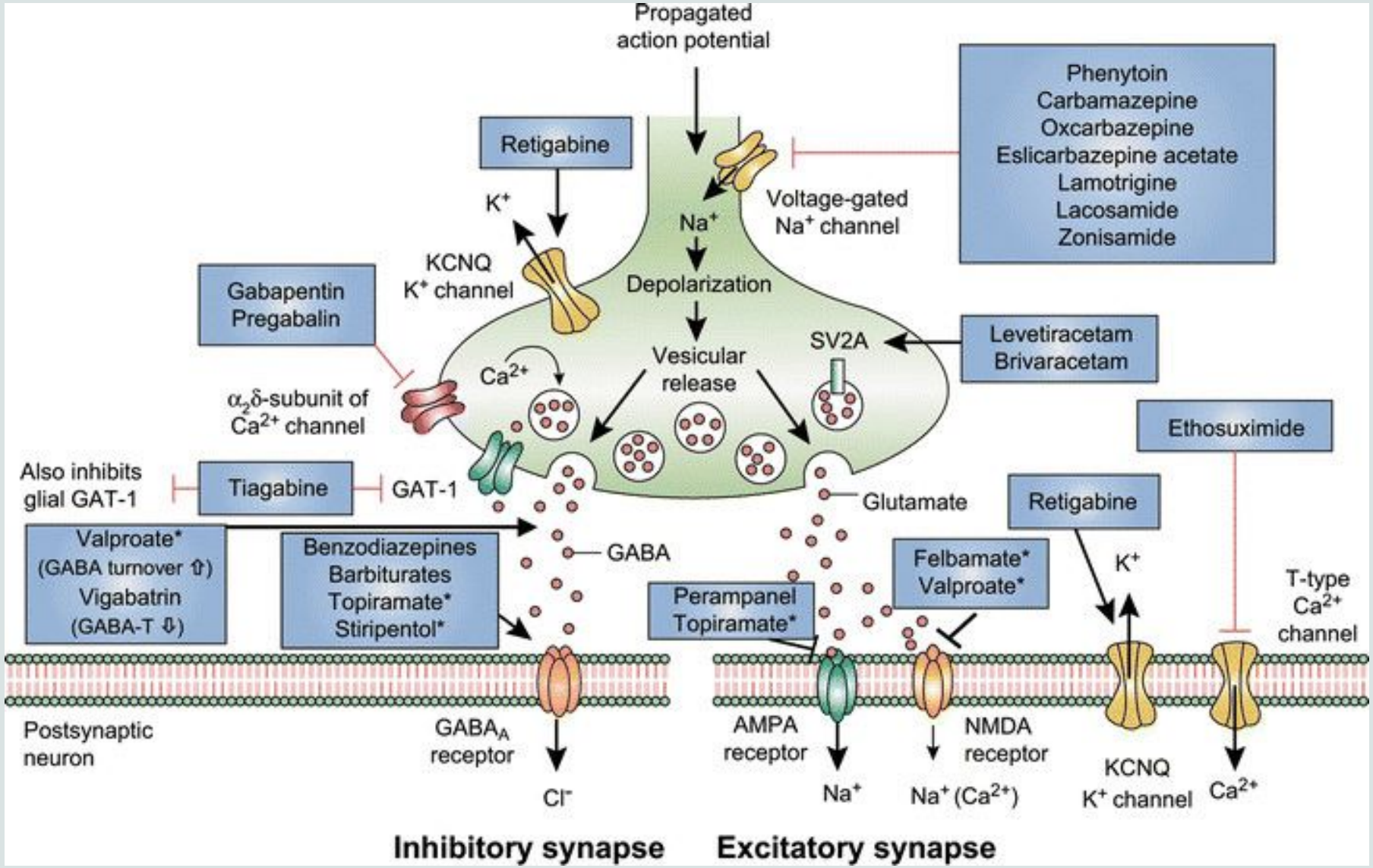
- Nerve stimulation

  Stimulate vagus nerve

- Ketogenic diet



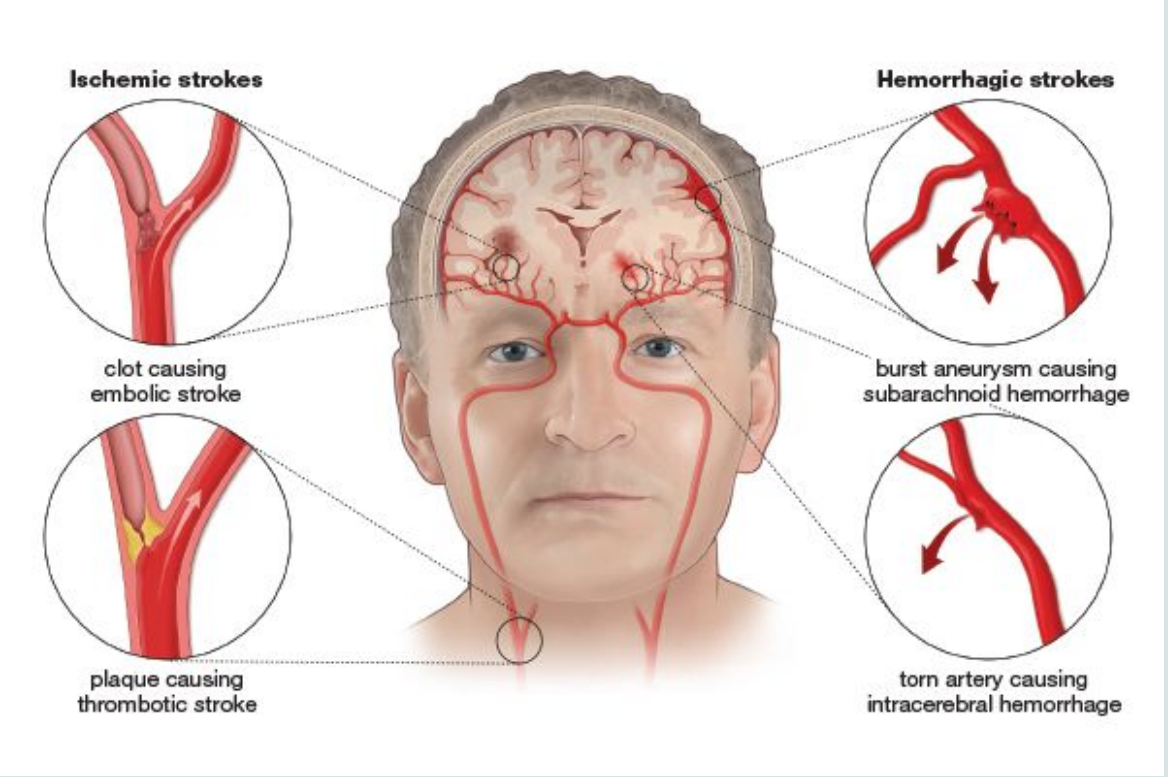
Epilepsy treatment



Teratogenic effect
Phenytoin
Lamotrigine
Valproate

Stroke

- Damage to part of the brain caused by a problem with the blood supply
- There is a blockage or burst
- Usually happens quickly



Stroke

ISCHEMIC

- Death of tissue due to blockage by

  Thrombotic – atherosclerotic plaque

  Embolic – any other (fat, cholesterol, blood platelets, stenosis)

- Much more common
- Damage depends on location and time

HEMORRHAGE

- When an artery in the brain breaks, creating a pool of blood that damage the brain
- Bleeding in the brain
- Due to burst blood vessel

Stroke

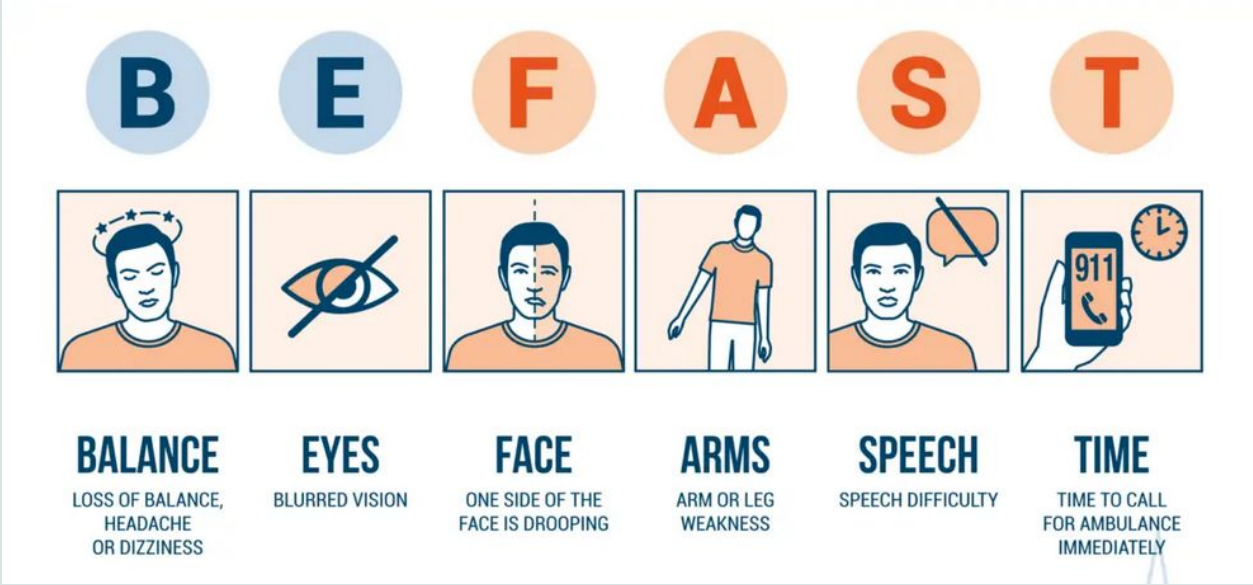

Risk factors for
Stroke
Obesity
Diabetes
High Blood Pressure
Sleep Apnea
High Cholesterol
Heavy Alcohol Use
Cardiovascular Disease
Smoking & Drug Use
Lack of Exercise

Transient ischemic attack

Effects last no longer than 24 hours from onset or the symptoms start to resolve within 1-20 min

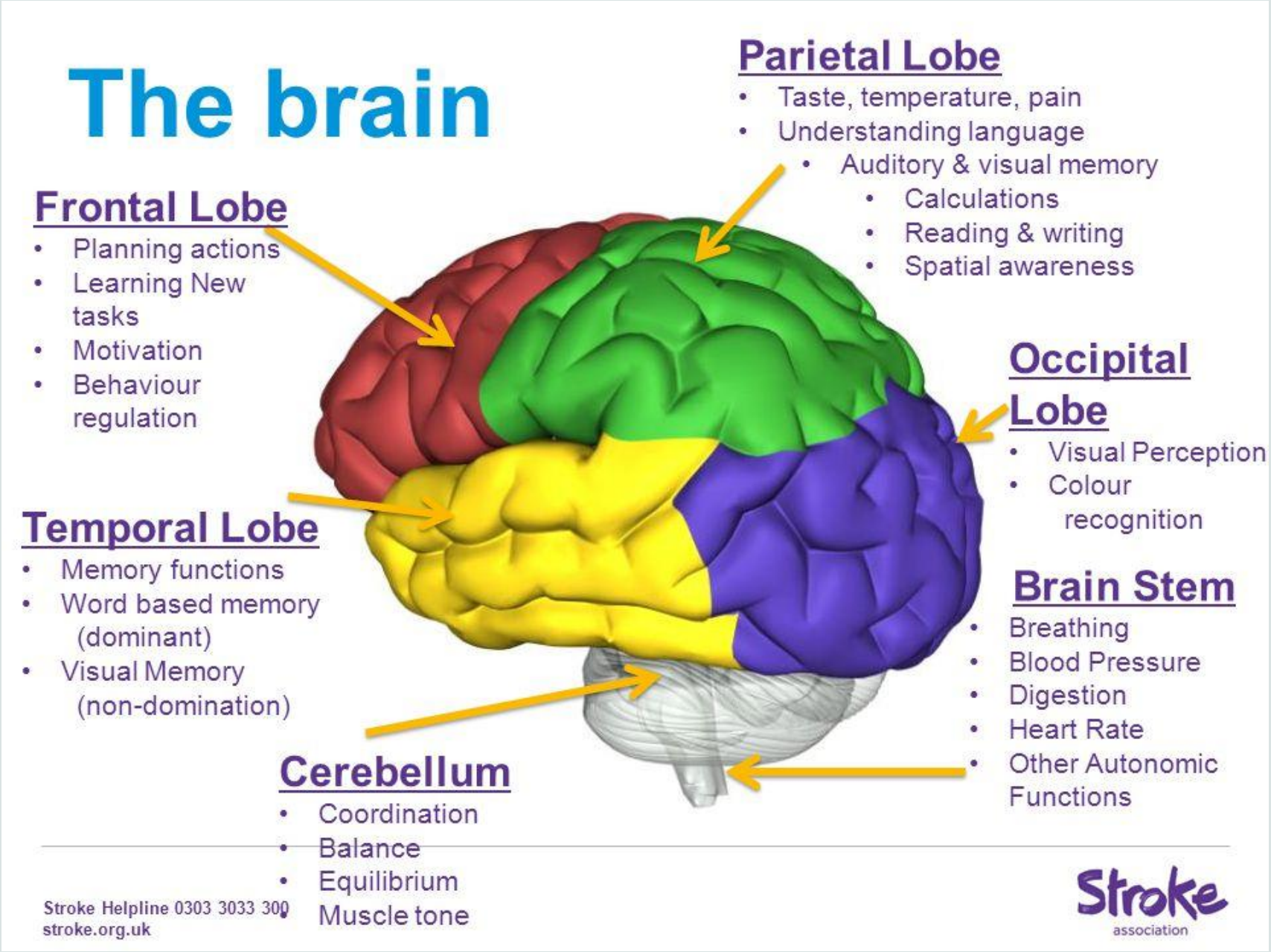
Minimal long-term damage

The FAST test helps people t o quickly recognize

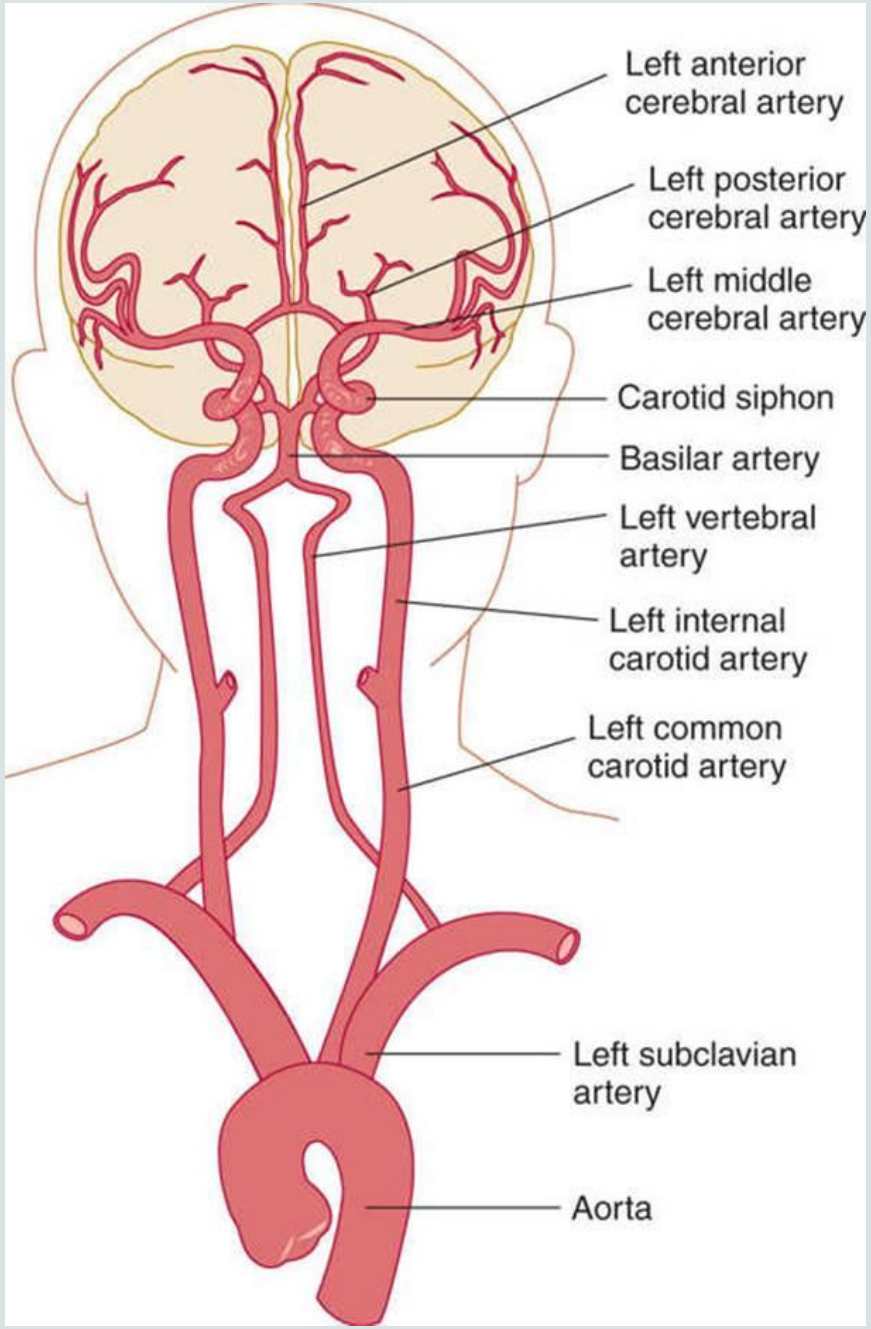


Stroke

The right cerebrum controls muscles on the left & vice versa



Stroke



- Feets and legs
- Visual cortex
- Hands, arms, face and speech
- coordination

Stroke

Diagnosis and Treatment

- CT scan of the head
- **+blood** to drop blood pressure a lot; neurosurgery: to coil, clip or craniotomy; give fresh frozen plasma
- **-blood** less than 3-4,5 hours tPA
- ECG – Atrial fibrillation, Atrial flutter. Warfarin, NOAC
- ECHO – Thrombose. Warfarin, NOAC, heparin bridge
- Carotid u/s –Carotid artery stenosis. Carotid endarterectomy stenting

Stroke Acute

- tPA (tissue plasminogen activator)

  For Ischemic Stroke! *Dissolve the clot by activating the protein that cause fibrinolysis*

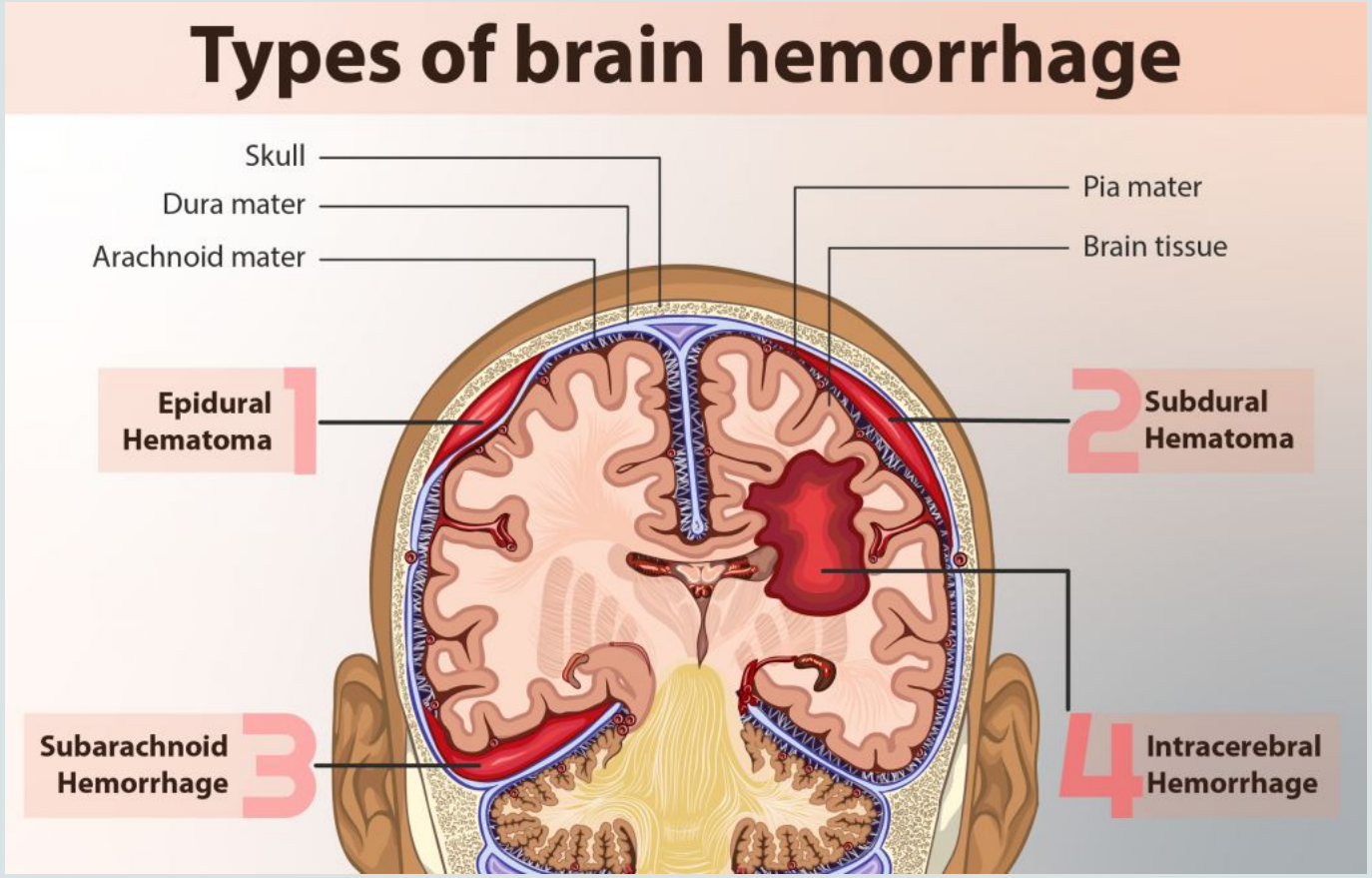
  Given within 3 hours (3-4,5) from onset

  Criteria: CT scan negative, labs within normal limits (glucose, INR, platelets), BP controlled <180/105; hasn't recently receive (heparin or other anticoagulants), any recent surgery

- Aspirin Prevent more clots – Aspirin 325mg

- Surgery Mechanical Embolus Removal in Cerebral Ischemia; Suction removal

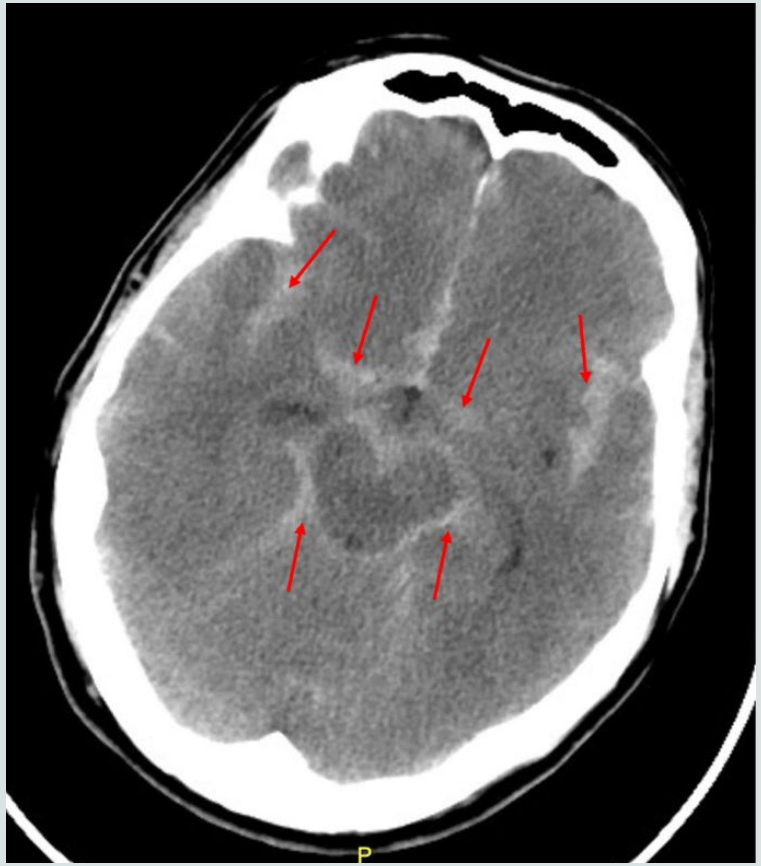
Hemorrhage


Types of brain hemorrhage
Skull
Dura mater
Arachnoid mater
Pia mater
Brain tissue
Epidural Hematoma
1
2
Subdural Hematoma
Subarachnoid Hemorrhage
3
4
Intracerebral Hemorrhage

Hemorrhage

Subarachnoid hemorrhage

- Causes by aneurysm (leaks or bleeds)
- Thunder clap headache (suddenly and maximally intensive), the sentinel bleed, neck stiffness, neurological deficit into coma
- Diagnosis: CT scan, MR/CT Angiogram , a lumbar puncture (xanthochromia)



Hemorrhage

Treatment:

- BP <140/<90 (beta blockers, calcium channels blockers);
- coil or clip
- Hydrocephalus: serial lumbar punctures, VP shunt
- Seizure prophylaxis: levetiracetam

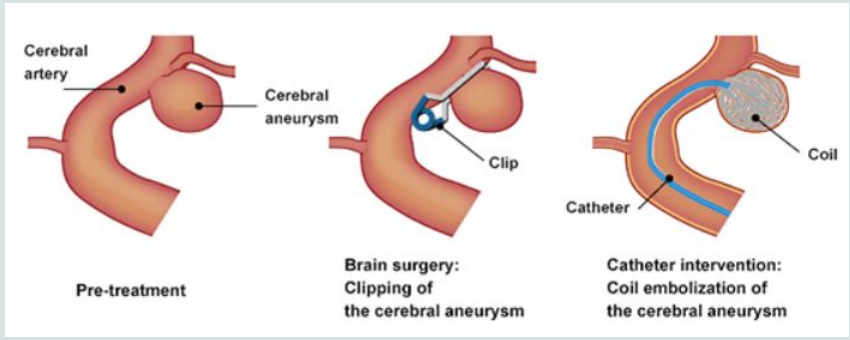
- Increased intracranial pressure:

  Hypertonic solution (mannitol or hypertonic saline)

  Elevated the head of the bed

  Hyperventilate

- Vasospasm: calcium channel blockers



Hemorrhage

Intraparenchymal

- Caused by hypertension
- Focal neurologic deficit, headache, nausea and vomiting, coma
- Diagnosis: CT scan
- Treatment: decrease intracranial pressure, craniotomy, evacuated the hematoma

Thank you