STROKE

For Class- B.Pharmacy 2nd Semester

Subject- Pathophysiology (BP204T)

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Stroke is

A focus episode of neurological deficit and brain tissue damage, results in episode of brain dysfunction due to focal ischemia and hemorrhage

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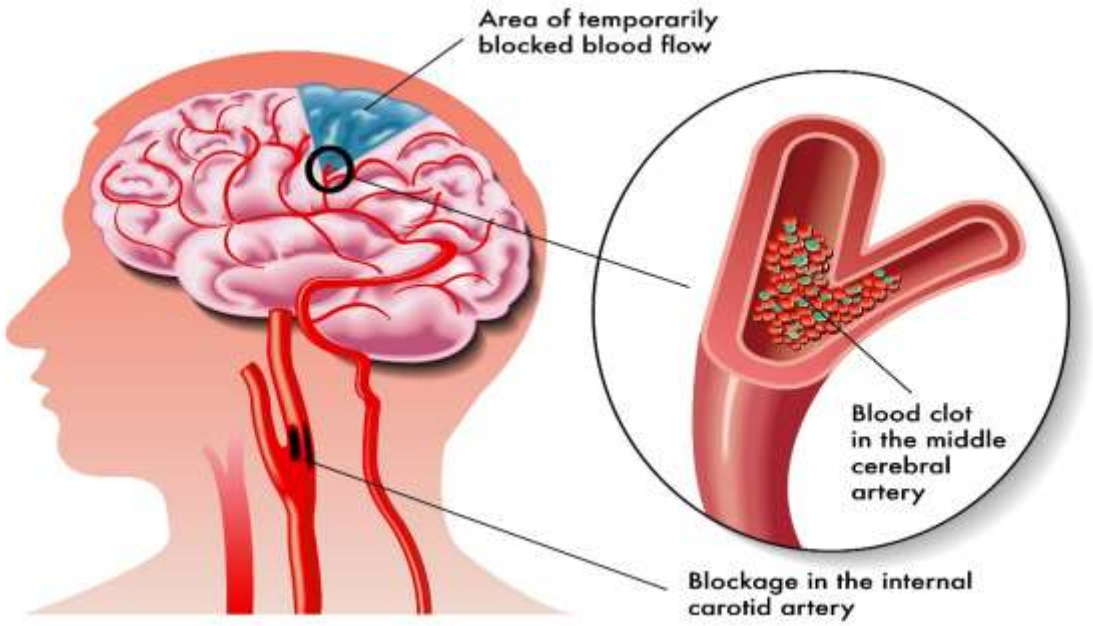
22nd edition,p-1237



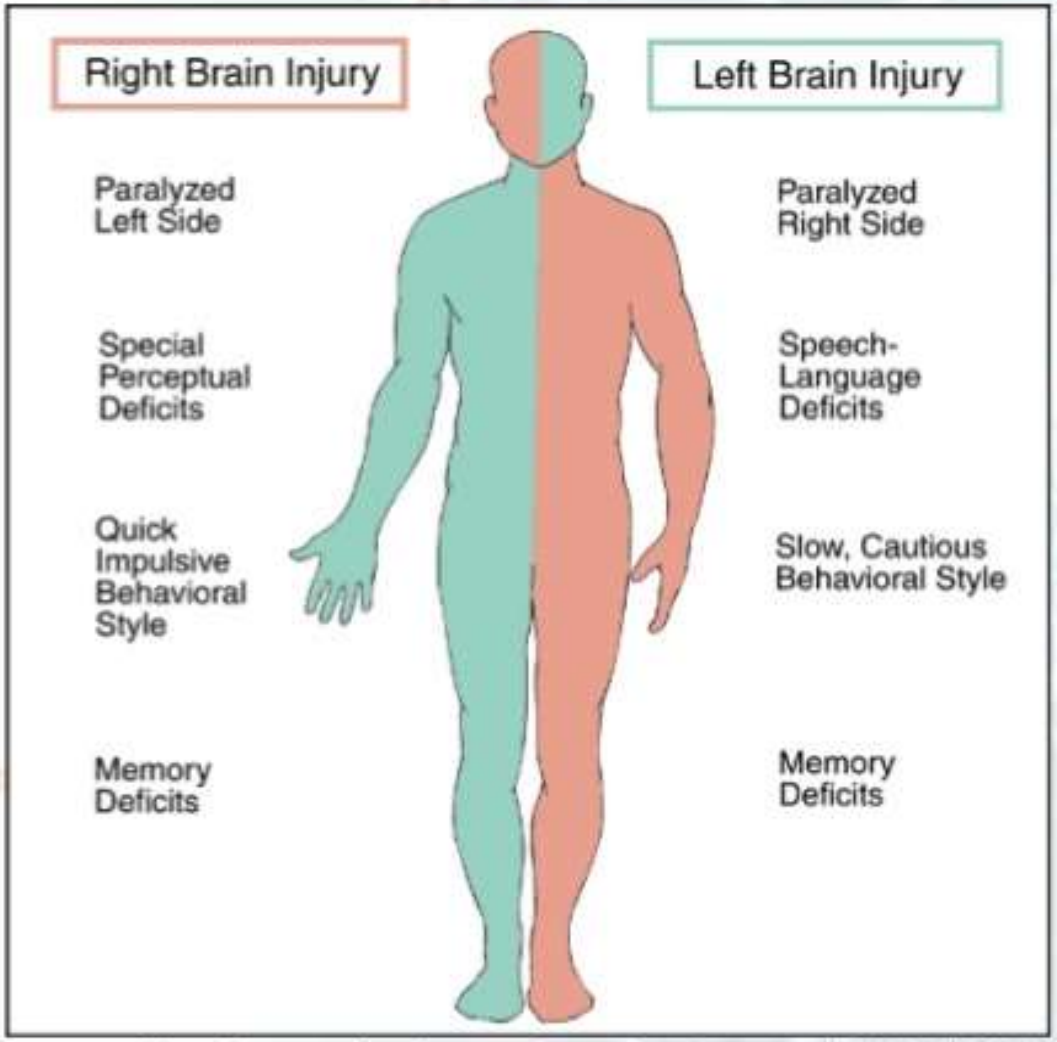
Symptoms

A sudden development of one or more following symptoms usually indicate a stroke

- Paralysis or weakness in the face, arm and/or legs
- Confusion
- Personality change
- Sudden trouble in talking or difficulty in understanding speech
- Sudden trouble in walking, dizziness, loss of balance, or lack of coordination
- Sudden change in eye-sight
- Decreased motor skills
- Severe headaches

- American heart association, American stroke association

The symptoms of a stroke are dependant on what portion of the brain is damage.



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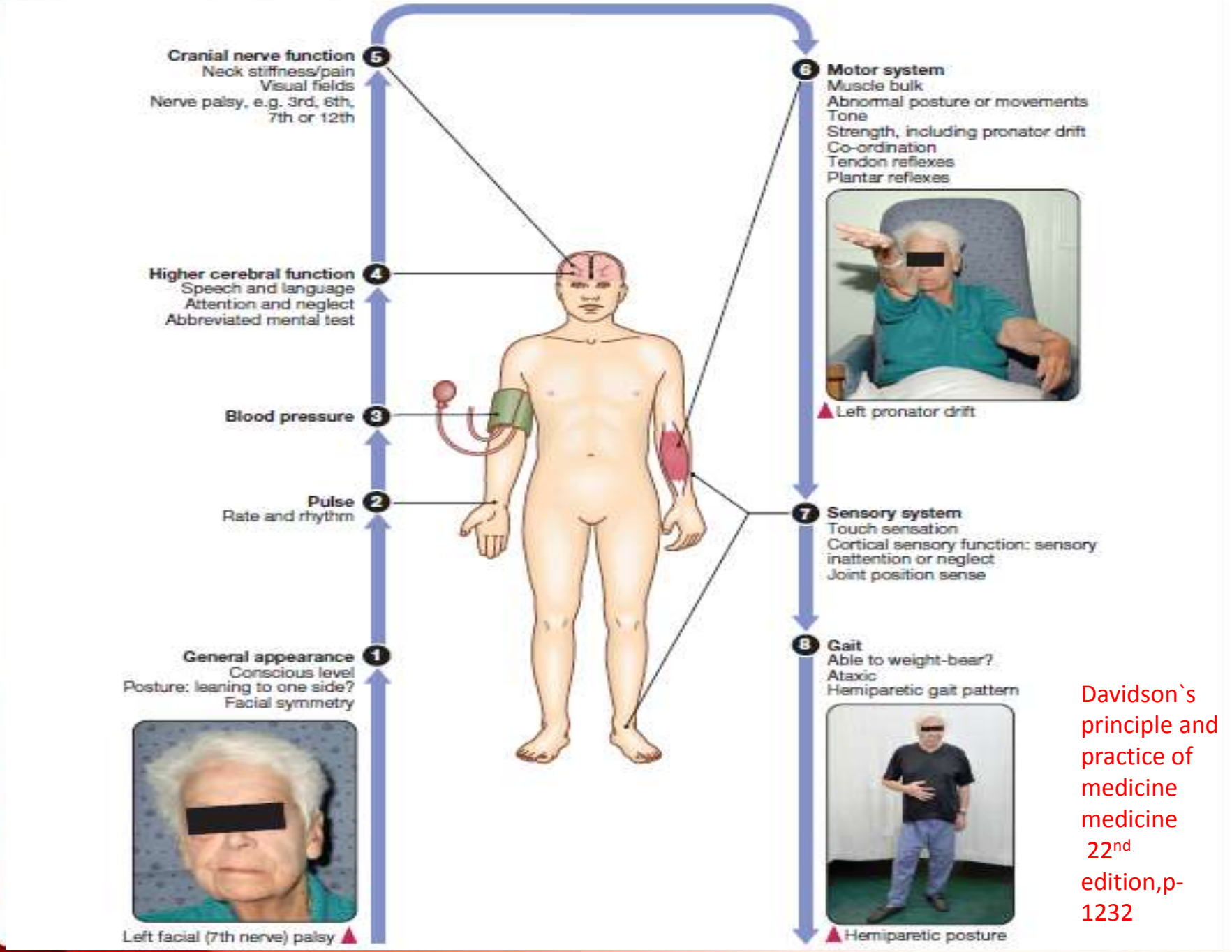

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Risk factors of Stroke

Fixed risk factors:

- Age
- Gender (Male> female; except the extreme of the age)
- Race (Afro- Carrebean> Asian> European)
- Previous vascular event
  - Myocardial Infarction
  - Stroke
  - Peripheral vascular disease
- Heredity
- High-fibrinogen

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Risk factors (cont.)

Modifiable risk factors:

- High blood pressure
- Diabetes mellitus
- Cigarette smoking
- Hyperlipidemia
- Excessive alcohol intake
- Heart disease
  - Atrial fibrillation
  - Congestive cardiac failure
  - Infective endocarditis
- Oestrogen-containing drugs
  - Oral contraceptive pill
  - Hormone replacement therapy
  - Polycythaemia

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Types of Stroke

- Ischemic (Blockage) 85%
  - Caused by a blockage in the blood vessels to the brain
- Hemorrhagic (Bleeding) 15%
  - Caused by burst or leaking blood vessels in the brain

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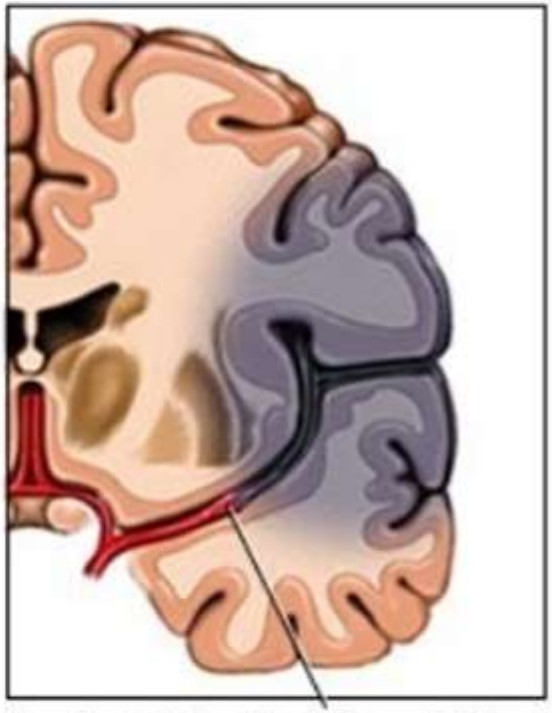
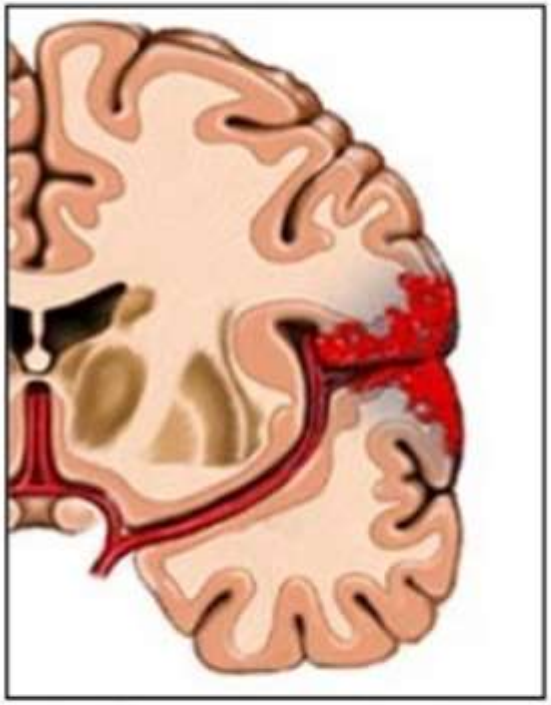
Types of stroke:

Ischemic stroke



A clot blocks blood flow to an area of the brain

Hemorrhagic stroke



Bleeding occurs inside or around brain tissue

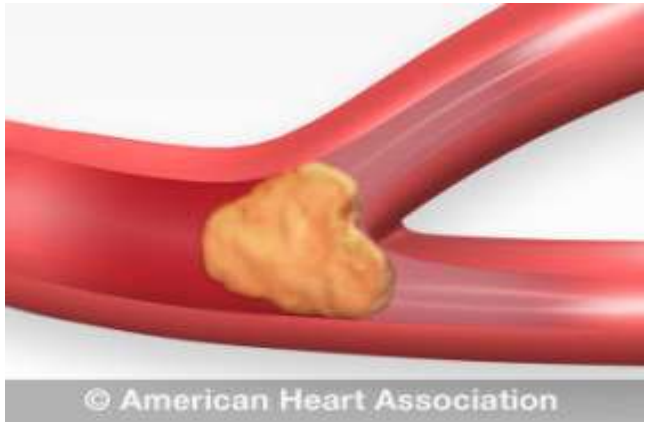
http://www.memorialhermann.org/library/healthguide/en-us/images/media/medical/hw/h5551195.jpg

Causes for an Ischemic Stroke

Fatty deposits line the blood vessel wall

- Thrombus: A blood clot forms at the fatty deposit

- Embolus: A traveling particle gets stuck in a small vessel



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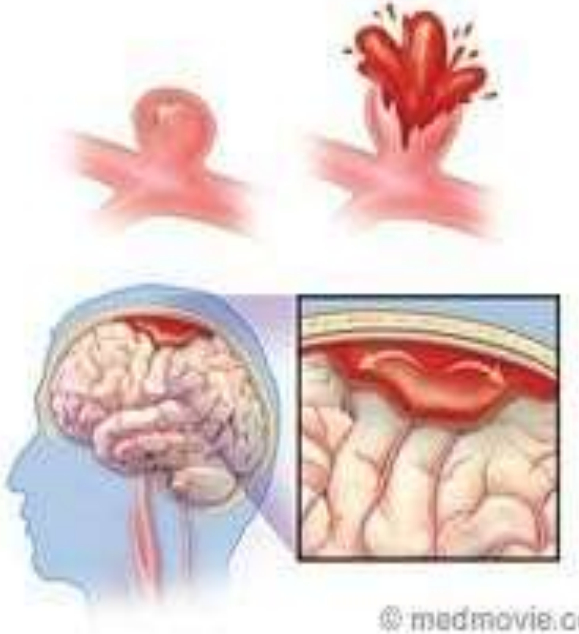
Causes for a Hemorrhagic Stroke

A weakened blood vessel ruptures

- Aneurysms: Ballooning of a weakened spot of a blood vessel

- Arteriovenous Malformations (AVMs): Cluster of abnormal blood vessels



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Transient Ischemic Attacks (TIAs)

- TIAs are “warning strokes” that can happen before a major stroke
- They occur when blood flow through a brain artery is briefly blocked or reduced
- TIA symptoms are temporary but similar to those of a full-fledged stroke
- A person who has a TIA is 9.5 times more likely to have a stroke
- A TIA is a medical emergency

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Pathophysiology of stroke

Of the 180–300 patients per 100 000 population presenting annually with a stroke, 85% sustain a cerebral infarction due to inadequate blood flow to part of the brain, and most of the remainder have an intracerebral hemorrhage.

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Pathophysiology (cont.)

Cerebral infarction:

- Caused by thromboembolic disease secondary to atherosclerosis in the major extra cranial arteries (carotid artery and aortic arch)
- Takes some hours to complete

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Pathophysiology (cont.)

Intracerebral Hemorrhage

- Intracerebral hemorrhage causes about 10% of acute stroke events but is more common in low-income countries
- Results from rupture of a blood vessel within the brain parenchyma
- Hemorrhage frequently occurs into an area of brain infarction

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Complication

- Chest infection
- Dehydration
- Hyponatremia
- Hypoxaemia
- Seizures
- Hypoglycaemia
- Deep venous thrombosis
- Frozen shoulder
- Pressure sores
- UTI
- Constipation
- Depression and anxiety

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Stroke is Preventable, Beatable and Treatable!

- 80% of all strokes can be prevented with healthy behaviors
- Long-term effects of a stroke may be minimized with immediate treatment
- More people are surviving and beating stroke

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When a Stroke Occurs: What to Do?

world health rankings
research and features

TREATMENT

- Stroke is always medical emergency
- 50% of the patient may need to treat in the hospital
- Treatment guidelines differs according to type of stroke

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Treatment of Ischemic stroke

General treatment

- ✓ Care of nutrition-by ryles tube if needed
- ✓ Care of bladder by self retaining catheter
- ✓ Care of skin, limb by frequent posture change
- ✓ Care of mouth by frequent mouth wash

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Symptomatic treatment

- ✓ Treatment of co-existing disease like hypertension, diabetes mellitus, cardiac disease, renal disease etc
- ✓ Intravenous fluid in all cases in normal saline if not contraindicated

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Treatment (cont.)

- ✓ **If hypertension:** drugs are preferred are ACE inhibitors, ARB, Calcium- channel blocker, diuretics, alpha-blockers, beta-blockers etc
- ✓ **If diabetes** in acute stage of stroke is always by insulin, preferably by soluble insulin, target blood sugar is 7-8 mmol (post prandial)
- ✓ **For cardiac disease**, it is better to consult with appropriate physician and to avoid excess load on heart side by side

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Treatment of complication

- ✓ If any complications like- aspiration pneumonia, UTI, bed sore, convulsion, headache, insomnia, constipation; appropriate drugs should be applied

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Specific treatment

- ✓ Antiplatelet, Aspirin 300mg stat and then 75-150mg daily for life long. If aspirin is contraindicated then clopidogrel 75mg daily for life long.
- ✓ Low molecular heparin or oral anticoagulation for cardioembolic stroke
- ✓ Lipid lowering agent for dyslipidaemia
- ✓ Physiotherapy

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Treatment of hemorrhagic stroke

Treatment (cont.)

- ✓ General and symptomatic treatment are like ischemic stroke
- ✓ The difference is in specific treatment

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Specific treatment

- ✓ Antiplatelet and anticoagulant in any form is contraindicated in hemorrhagic stroke
- ✓ Supportive treatment should be continued
- ✓ Surgical treatment is needed in some case of Intra-cranial hemorrhage (ICH) and sub arachnoid hemorrhage (SAH)
- ✓ NSAIDs are contraindicated in headache
- ✓ Paracetamol and tramadol is used for headache in SAH
- ✓ In SAH oral Nimodipine 60mg 4/5 times daily for 2-3 weeks are given to prevent vasospasm

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Surgery in stroke

- Occasionally surgery has role in ischemic stoke. E.g. in hemispheric stroke- craniotomy can be done to decompress brain
- But in ICH if patient is gradually becoming unconscious and if the hematoma size is >60ml; in approachable area, surgery is done for life saving purpose
- In case of SAH particularly aneurysmal bleeding- clipping or coiling is done

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Rehabilitation

The ultimate objective is to rehabilitate the patient. The patient should be referred to the physical medicine expert as a part of rehab as early as possible

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Outcome

With appropriate treatment 30-40% patient is cured. (e.g. they can go back to their original work), 30% patient remains disabled, and 20% may die

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Can I Prevent a Stroke?

Knowing the risk factors of the stroke is the first step.

Now we can get start

80% of all Strokes Are Preventable

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Reduce You Stroke Risk

- Control high blood pressure
- Don’t smoke
- Consume less sodium
- Lower cholesterol
- Lose excess weight
- Get physically active

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Stop Smoking

- Smoking accelerates the forming of clots, thickens blood, and increases plaque buildup in the arteries. If you smoke, stop!
- Ask your doctor about nicotine patches, counseling, or programs that have worked for others.
- Don’t get discouraged – It could take several attempts.
- Keep trying – Quitting smoking can have almost immediate beneficial effects on your health.

Get to Your Healthy Weight

- Carrying extra weight can make you more apt to develop high blood pressure, heart problems, and diabetes – all increasing your risk of stroke
- Talk to your doctor about your ideal weight, body mass index, and percentage of body fat to make sure you're in a healthy range.
- Losing just 10 pounds can improve your health and reduce your risk of stroke

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Be Active

- Physical activity can help you lose weight and reduce stress which can lower blood pressure and cholesterol, control diabetes, and improve your overall health
- Talk to your doctor about starting an exercise program
- Try to be active for 30 minutes every day
- If you can’t do it all at once, try to be active for 10 to 15 minutes at a time

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Watch What You Eat

- This is about nutrition – not dieting. The food choices you make can improve your health and reduce your risk of stroke
- Eat plenty of fruits and vegetables, which are high in fiber
- Limit salt to help lower your blood pressure.
- Eat less cholesterol and fat which can create plaque buildup in your arteries