Le Scaphandre et le Papillon

IMRAN KHAN

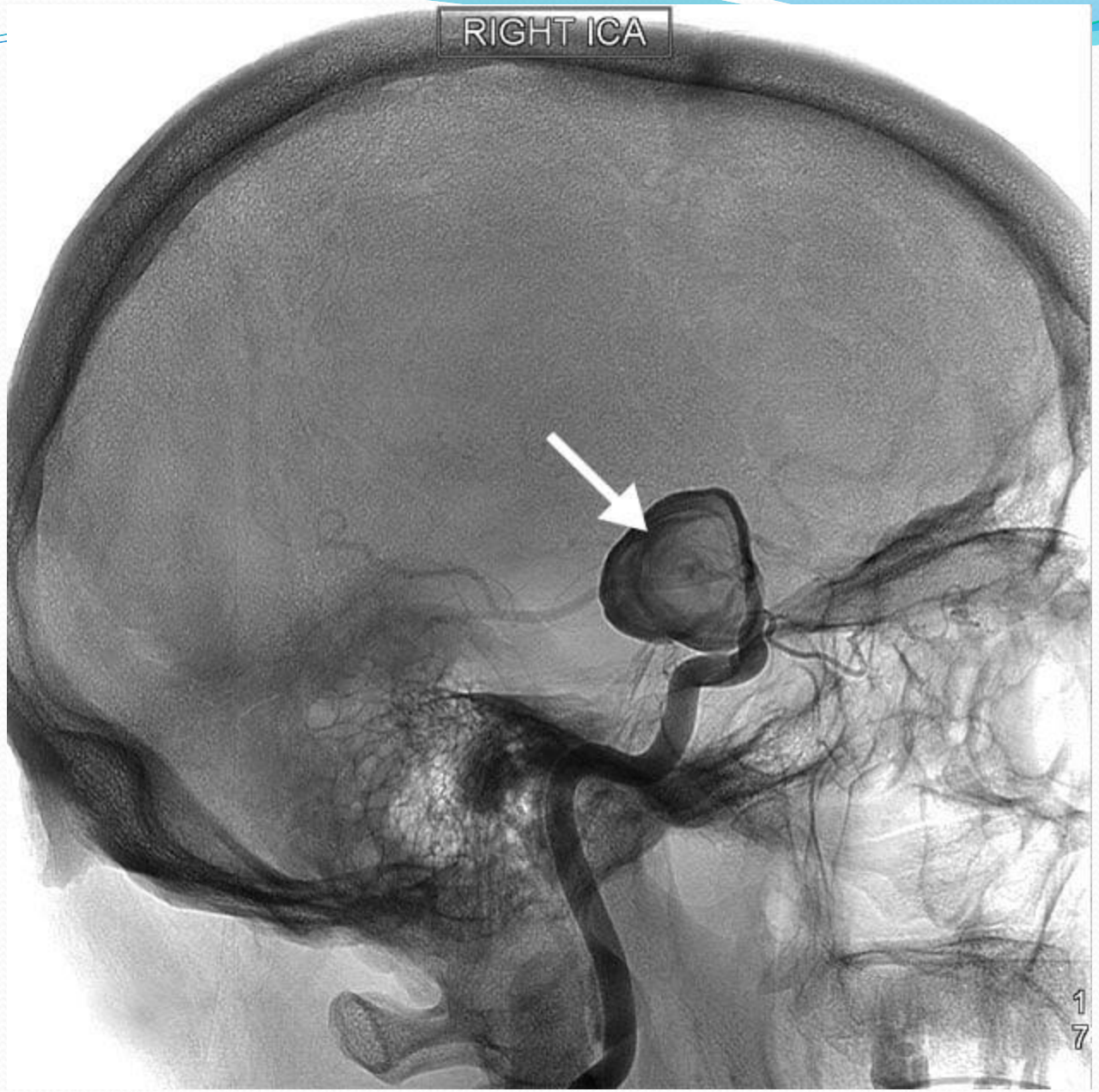
#1 INTERNATIONAL BESTSELLER

THE DIVING BELL AND THE BUTTERFLY

"A wistful, poetic, ironic and substantially affirmative testament by a man who refused to die in spirit."
—*The New York Times*

JEAN-DOMINIQUE BAUBY

- In 2019, there were 6.6 million deaths attributable to cerebrovascular disease worldwide (3.3 million deaths from ischemic stroke, 2.9 million deaths from intracerebral hemorrhage (ICH), and 0.4 from subarachnoid hemorrhage).


RIGHT ICA
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- **STROKE** is defined by the World Health Organization as a clinical syndrome consisting of 'rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting more than 24 h or leading to death with no apparent cause other than that of vascular origin'.

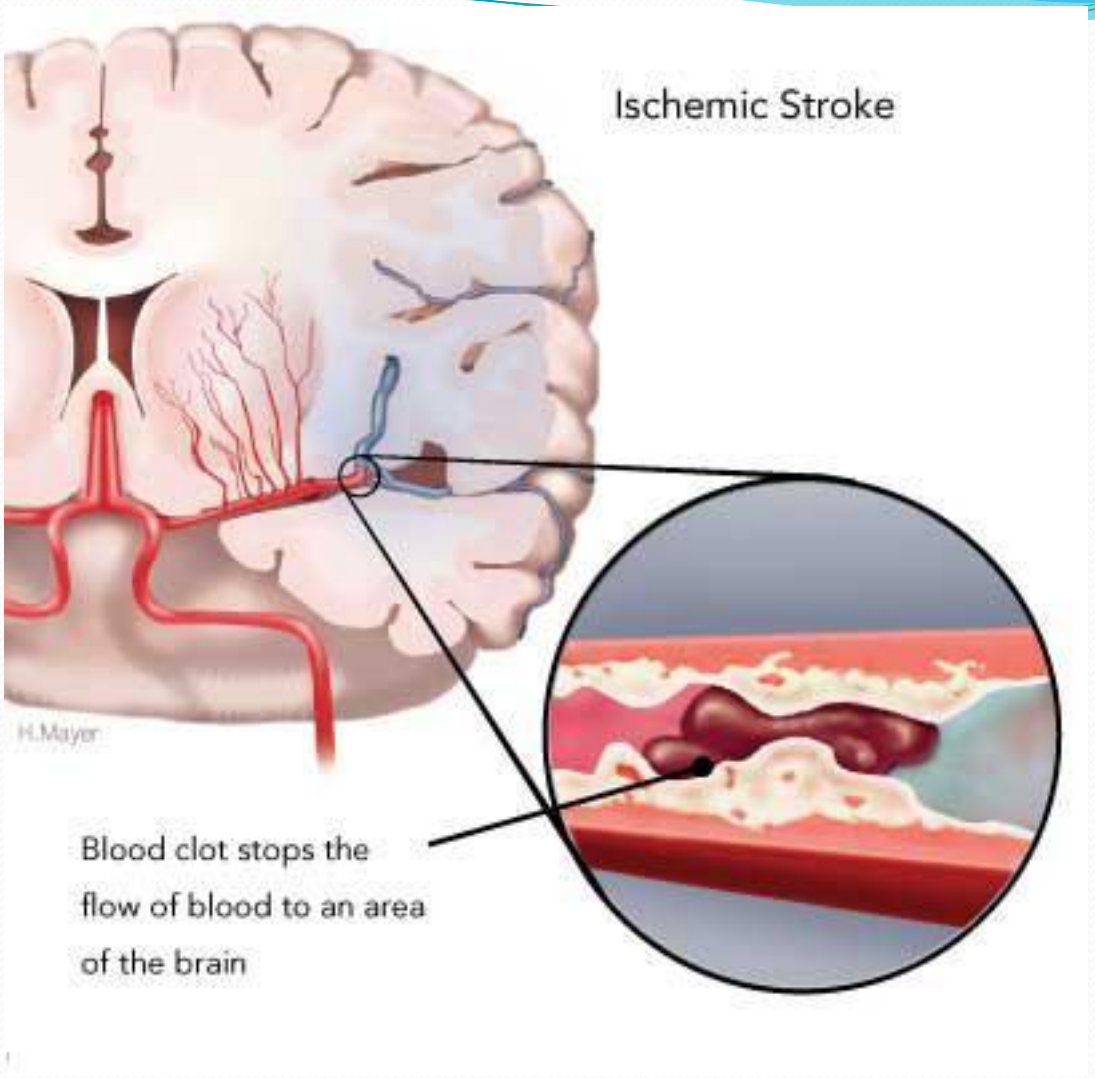
- **TRANSIENT ISCHAEMIC ATTACK (TIA)** is defined as stroke symptoms and signs that resolve within 24 hours

TYPES

- **ISCHEMIC STROKE (80 %)**
- **HEMORRHAGIC STROKE**

1. Intracerebral hemorrhage (15 %)
2. Subarachnoid hemorrhage (5 %)

- **VENOUS SINUS THROMBOSIS**


Ischemic Stroke
H.Mayer
Blood clot stops the
flow of blood to an area
of the brain

ISCHEMIC STROKE

Lacunar infarction : Lesion <5mm in diameter usually in the basal ganglia ,pons ,cerebellum and internal capsule.

- Associated with poorly controlled hypertension.
- Sometimes visible on CT scan.
- Recovery is usually good.

CEREBRAL INFARCTION : Due to embolic or thrombotic occlusion of the major vessels

- Causes of embolic are cardiac or from the major extra cranial artery.

Cardiac causes include :

1. Atrial fibrillation
2. Rheumatic heart disease
3. Mitral valve disease
4. Infective endocarditis
5. Atrial myxoma
6. Mural thrombi complicating MI
7. ASD leading to paradoxical embolism.

- An **ulcerated plaque** on a major artery to the brain.
- Less common

  abnormalities of blood vessels :

o Fibromuscular dysplasia

o Atherosclerosis of the aortic arch

o Inflammatory arterial disorders like giant cell arteritis , SLE , Polyarteritis , granulomatous angitis , meningovascular syphilis

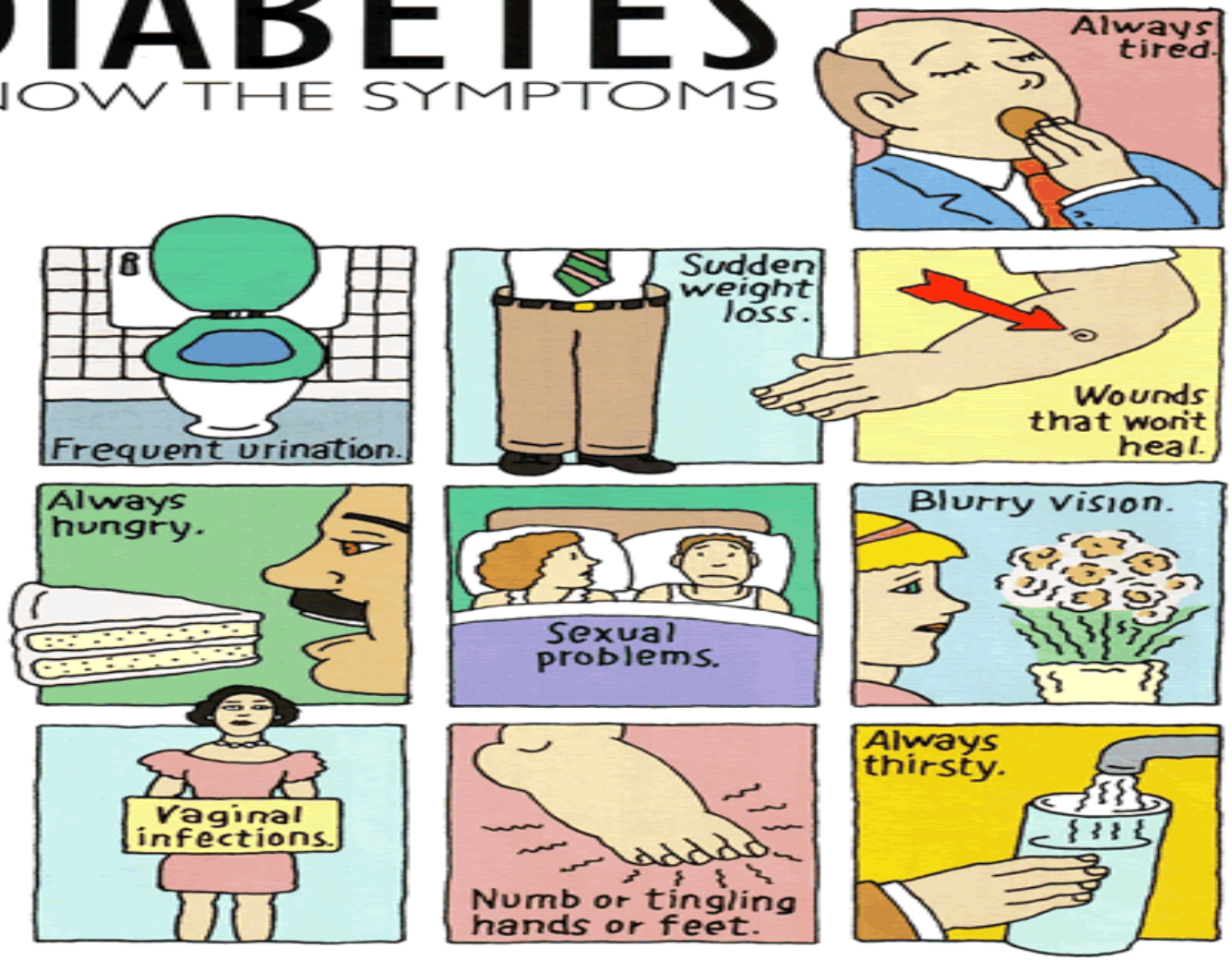
o Hematological like polycythemia , sickle cell disease , hyperviscosity syndrome , severe anemia.

Risk Factors


MY BODY IS
A TEMPLE!!

DIABETES

KNOW THE SYMPTOMS



If you have any of these symptoms, see your doctor. For more information about diabetes call Eli Lilly and Company at 1-800-545-5979 or Boehringer Mannheim Corporation at 1-800-858-8072.

Provided as an educational service by Eli Lilly and Company and Boehringer Mannheim Corporation

Valeur systolique

Hypertension sévère 180 mm Hg ou plus

Hypertension moyenne 160–179 mm Hg

Hypertension légère 140–159 mm Hg

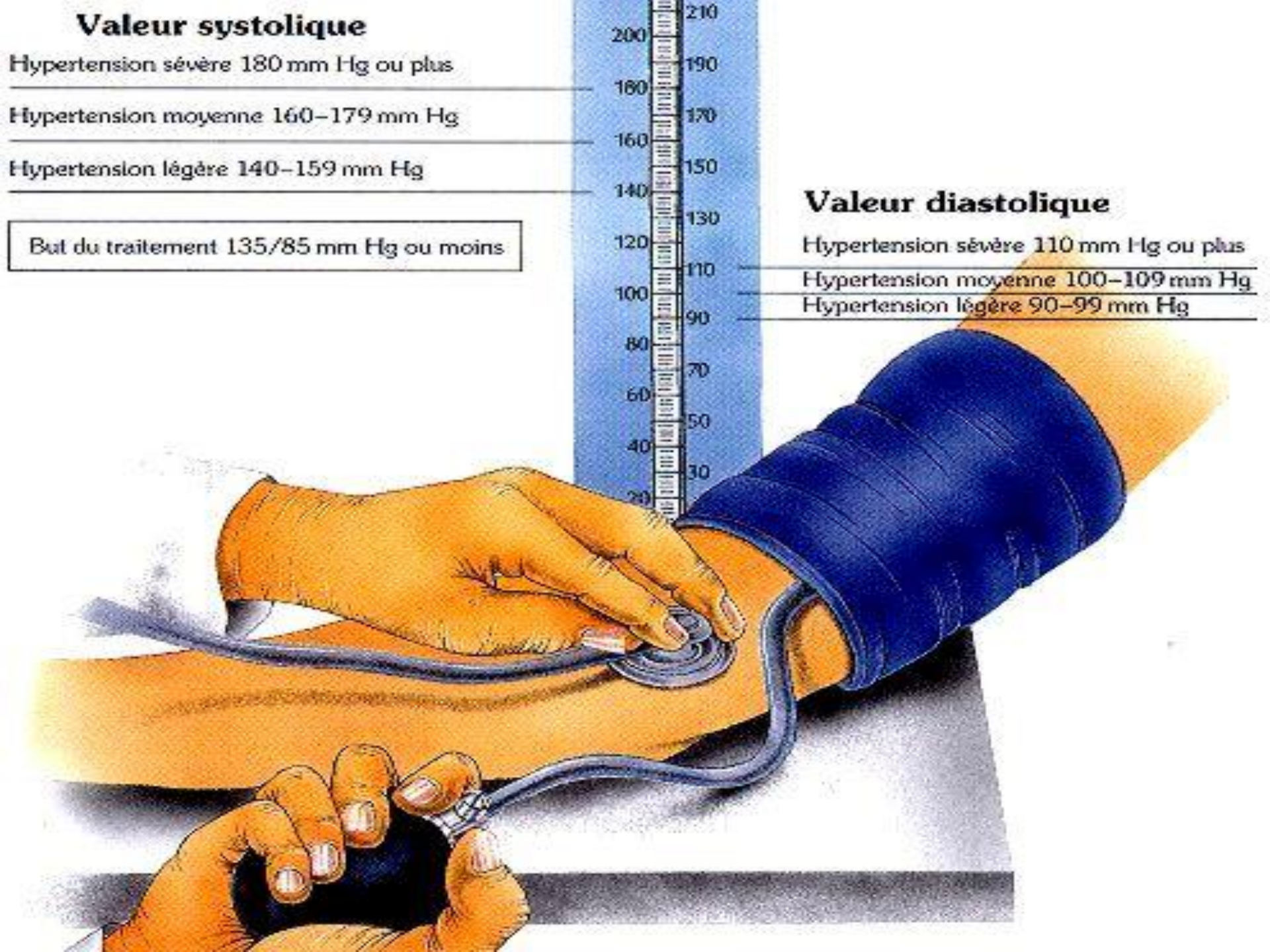
But du traitement 135/85 mm Hg ou moins

Valeur diastolique

Hypertension sévère 110 mm Hg ou plus

Hypertension moyenne 100–109 mm Hg

Hypertension légère 90–99 mm Hg



SIGNS AND SYMPTOMS

Consider stroke in any patient presenting with acute neurologic deficit or any alteration in level of consciousness. Common stroke signs and symptoms include the following:

- Abrupt onset of hemiparesis, monoparesis, or (rarely) quadriparesis
- Hemisensory deficits
- Monocular or binocular visual loss
- Visual field deficits

- Diplopia
- Dysarthria
- Facial droop
- Ataxia
- Vertigo (rarely in isolation)
- Nystagmus
- Aphasia
- Sudden decrease in level of consciousness

Signs of brain stem involvement

Clinical features

1. Hemiparesis or tetraparesis
2. Sensory loss
3. Diplopia
4. Facial numbness
5. Facial weakness
6. Nystagmus,vertigo
7. Dysphagia,dysarthria

Structure involved

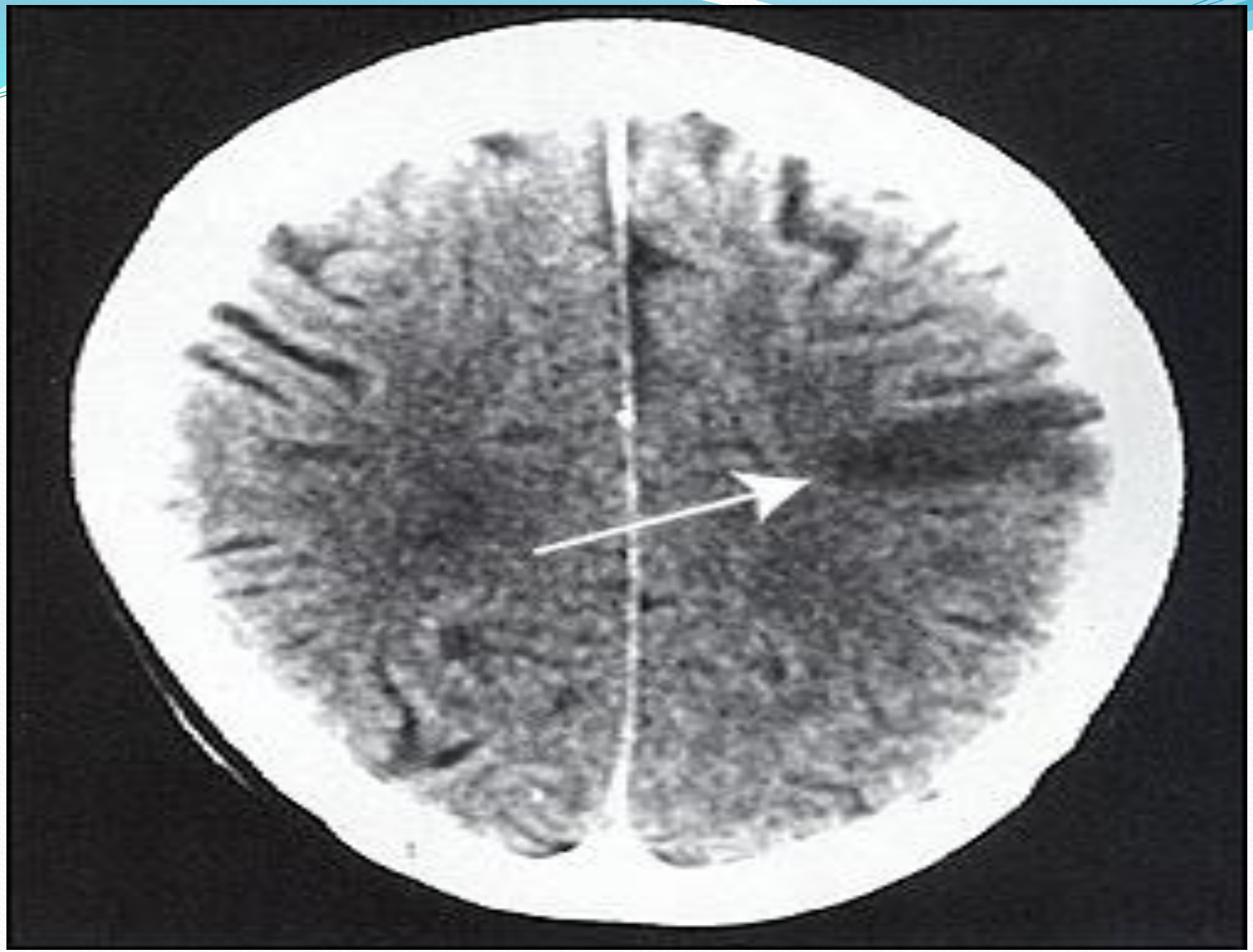
1. Corticospinal tract
2. Medial leminiscus and spinothalmic tract
3. Occlumotor system
4. 5^{th} nerve
5. 7^{th} nerve
6. 8^{th} nerve
7. 9^{th} and 10^{th} nerve

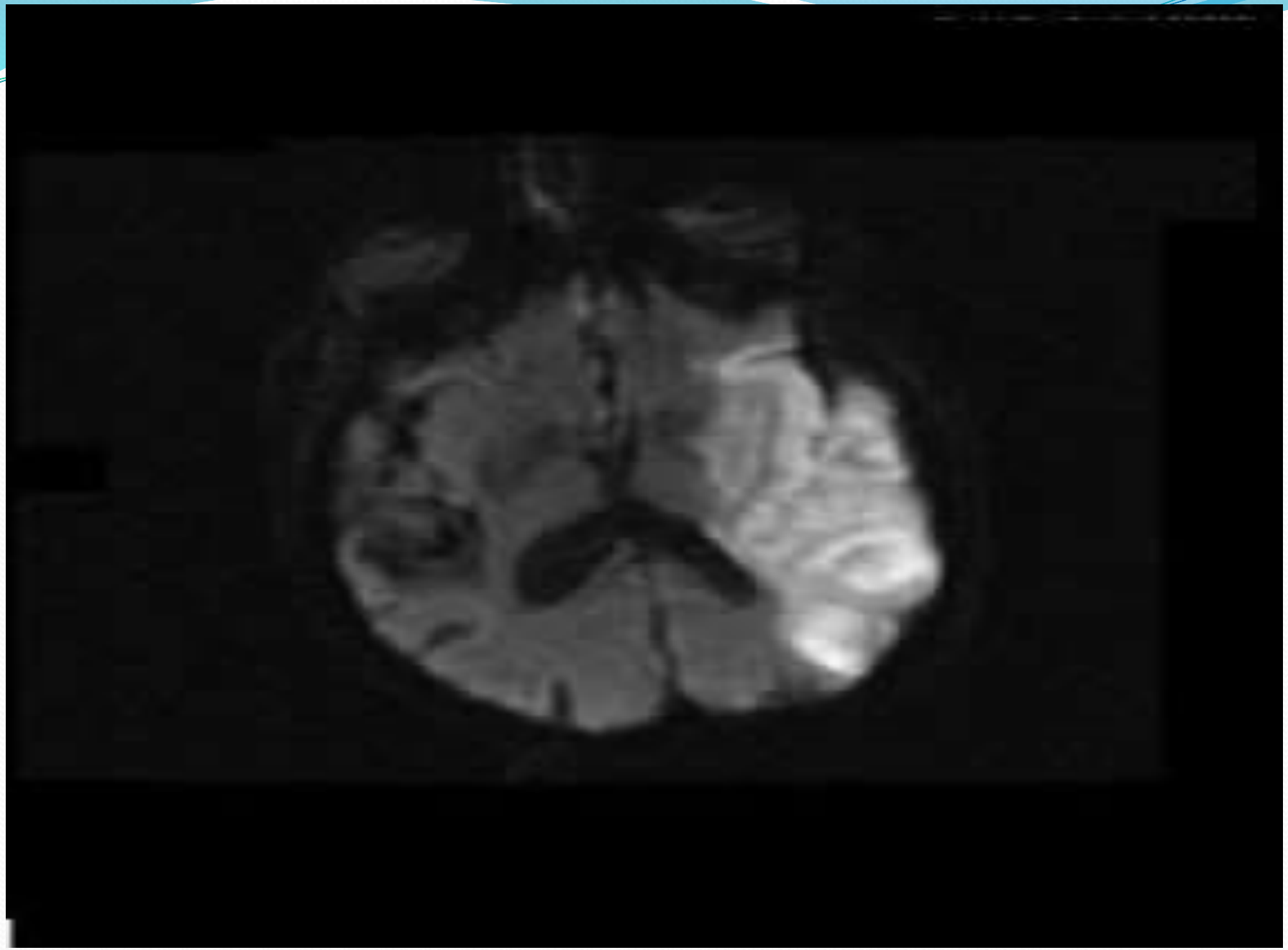
Cont

- Dysarthria,ataxia,hiccups,vomiting.
- Horner's syndrome
- Altered consciousness
- Brain stem and cerebellar connections
- Sympathetic fibers
- Reticular formation

Imaging

- CT scan preferable to MRI in acute stage.
- In selected patients, carotid duplex studies,MRI and MR angiography and conventional angiography
- MR angiography is highly sensitive for stenosis of extracranial internal carotid arteries and large intra cranial vessels but MR angiography tends to overestimate the degree of stenosis when compared to conventional X-ray angiography.
- X ray chest may reveal cardiomegaly or valvular calcification
- Conventional X-ray angiography is the gold standard.





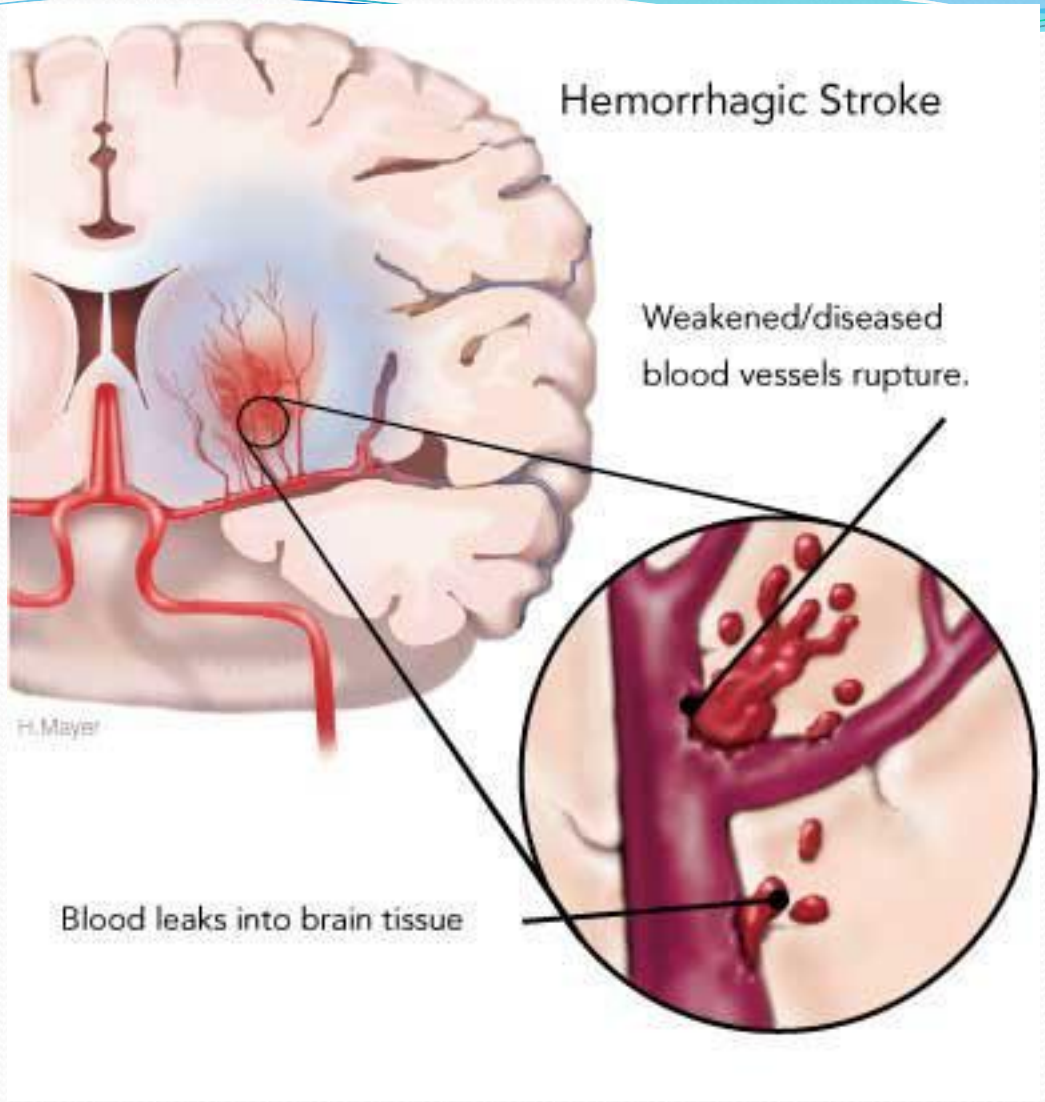
Lab and other studies

- CBC, ESR, RBS, serological tests for syphilis.
- Antiphospholipid antibody.
- Serum lipid profile.
- ECG.
- Blood cultures.
- Echocardiography

HEMORRHAGIC STROKE

INTRACEREBRAL HEMORRHAGE

- Usually due to hypertension.
- May occur due to hematological disorders like leukemia, thrombocytopenia, hemophilia, DIC, anticoagulant therapy, liver disease, cerebral amyloid angiopathy, high alcohol intake and brain tumors


Hemorrhagic Stroke
Weakened/diseased
blood vessels rupture.
H.Mayer
Blood leaks into brain tissue

Symptoms and signs

- Loss of consciousness
- Vomiting, headache
- Neurological deficit
- Loss of conjugate lateral gaze, loss of upward gaze, pupillary inequalities
- Cerebellar hemorrhage presents with nausea, vomiting, disequilibrium, headache, loss of consciousness
- Examination shows lateral conjugate gaze palsy to side of lesion, small reactive pupil,

Cont

- Contralteral hemiplegia, facial weakness, gait ataxia, periodic respiration.

Imaging

- CT scan preferable to MRI in acute stage
- Hemorrhage not easily detected on MRI in 1st 48 hrs
- MRI or MRA
- Conventional angiography
- X-ray chest

Lab and other studies

- CBC, platelets count, bleeding time.
- PT, APTT
- LFTs, RFTs.
- LP is contraindicated

SUBARACHNOID HEMORRHAGE:

- Sudden severe headache
- Signs of meningeal irritation
- Focal deficit frequently absent
- Usually from rupture of aneurysm or AV malformation
- No cause found in 20% cases

Imaging

- CT scan preferable
- More sensitive than MRI in detecting hemorrhage
- If CT normal but strong clinical suspision do LP
- Cerebral angiography
- MR angiography

MANAGEMENT GUIDELINES

- Remember two tests.

1. FAST
2. ABCD

Cont

- **FAST** – Face Arm Speech Test. Used to screen for the diagnosis of stroke or TIA.
- **Facial weakness** – can the person smile? Has their mouth or eye drooped?
- **Arm weakness** – can the person raise both arms?
- **Speech problems** – can the person speak clearly and understand what you say?
- Test all three symptoms

- **ABCD** Prognostic score to identify people at high risk of stroke after a TIA.
- It is calculated based on:
- **A** – age (≥ 60 years, 1 point)
- **B** – blood pressure at presentation (≥ 140/90 mmHg, 1 point)
- **C** – clinical features (unilateral weakness, 2 points; speech disturbance without weakness, 1 point)
- **D** – Duration of symptoms (≥ 60 minutes, 2 points; 10–59 minutes, 1 point)
- The calculation of ABCD also includes the presence of diabetes (1 point).

Rapid recognition of symptoms and diagnosis

- People who have had a suspected TIA who are at high risk of stroke (that is, with an ABCD score of 4 or above) should have:
- **aspirin** (300 mg daily) started immediately.
- Identify likely causes and appropriate investigations done in treatment started within 24 hours of onset of symptoms.
- Measures for secondary prevention introduced immediately.

Specialist care for people with acute stroke

- All people with suspected stroke should be admitted directly following initial assessment.
- Brain imaging should be performed immediately for people with acute stroke if any of the following apply:
- Indications for thrombolysis or early anticoagulation treatment.
- On anticoagulant treatment.
- A known bleeding tendency.
- A depressed level of consciousness (Glasgow Coma Score below 13).
- Unexplained progressive or fluctuating symptoms.

- Papilloedema, neck stiffness or fever.
- Severe headache at onset of stroke symptoms.
- In people with sudden onset of neurological symptoms, **hypoglycemia** should be excluded.
- People who have had a TIA but who present late (more than 1 week after their last symptom has resolved) should be treated as though they are at lower risk of stroke.

IMAGING IN PEOPLE WITH SUSPECTED TIA OR NON-DISABLING STROKE

- All people with symptoms should undergo brain imaging.
- In patients who have their symptoms resolved at the time of assessment, no imaging is needed but there are few conditions in which brain imaging should be done.
- People being considered for carotid endarterectomy where it is uncertain whether the stroke is in the anterior or posterior circulation

- People with TIA where haemorrhage needs to be excluded, for example long duration of symptoms or people on anticoagulants

- Where an alternative diagnosis (for example migraine, epilepsy or tumor) is being consider

Thrombolytic therapy

- Intravenous rtPA is given 0.9mg/kg to maximum 90mg with 10% in 1st min and remaining 90% in 1 hr
- **Indications** of thrombolytic therapy are
  - Onset of symptoms and time of drug administration < 4.5 hrs
  - CT scan shows no hemorrhage or edema of >1/3 of MCA area
  - Consent

- **Contraindications** are
- Sustain BP>185/110 despite treatment
- Platlets<100000.
- HCT<25%,glucose<50 or >400mg/dl
- Heparin used within 48hrs ,prolonged APTT ,elevated INR
- Rapidly improving symptoms
- Prior stroke or head injury within 3 months
- Major surgery with in 14 days
- GI bleed in 21 days
- Recent MI
- Coma or stupor

Anti platelet therapy

- **Aspirin** 300mg orally initially then 75mg/day continuous
- Patient allergic to Aspirin should get **Clopidogrel** 75mg/day.
- Combining Clopidogrel and Aspirin has no additional benefit
- Combination of Aspirin with **Dipyridamole** 200mg BD is most effective

Anticoagulation

- Anticoagulation reduces risk of embolism in
- AF
- Left ventricular dysfunction
- CCF
- Mural thrombi
- Target INR 2-3.
- In prosthetic heart valve patient INR should be 3-4
- If embolic source can not be excluded anticoagulation is life time.

REDUCTION OF BRAIN EDEMA

- **Prednisolone** (100mg per day) or **Dexamethasone** (16mg per day) reduces brain edema.
- IV **Mannitol** can be given.

Statin treatment

- Immediate initiation of statin treatment is not recommended in people with acute stroke.

- People with acute stroke who are already receiving statins should continue their statin treatment

Surgery for people with acute stroke

- If there is brain stem compression or obstructive hydrocephalus, immediate surgical evacuation is indicated.

- Hydrocephalus if developed can be relieved by external ventricular drainage.

Blood sugar control

- People with acute stroke should be treated to maintain a blood glucose concentration between 4 and 11 mmol/lit

Blood pressure control

- Anti-hypertensive treatment in people with acute stroke is recommended only if there is a hypertensive emergency with one or more of the following serious concomitant medical issues:
- hypertensive encephalopathy
- hypertensive nephropathy
- hypertensive cardiac failure/myocardial infarction
- aortic dissection
- pre-eclampsia/eclampsia
- intracerebral haemorrhage with systolic blood pressure over 200 mmHg

Nutrition and hydration

- On admission, people with acute stroke should have their swallowing screened.
- People with acute stroke who are unable to take adequate nutrition and fluids orally should:
- receive tube feeding with a nasogastric tube within 24 hours of admission
- be considered for a nasal bridle tube or gastrostomy if they are unable to tolerate a nasogastric tube

Early mobilization and optimum positioning of people with acute stroke

- People with acute stroke should be mobilized as soon as possible (when their clinical condition permits) as part of an active management program in a specialist stroke unit
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- People with acute stroke should be helped to sit up as soon as possible (when their clinical condition permits

Avoidance of aspiration pneumonia

- In people with dysphagia, food and fluids should be given in a form that can be swallowed without aspiration .

THANK YOU