Stroke presentation

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Introduction

- The World Health Organization defines stroke as the sudden onset of focal neurological signs, of presumed vascular origin, lasting longer than 24 hours or causing death

- Stroke accounts for 11% of all deaths and is a significant cause of morbidity.

• stroke can be classified as ischaemic, due to an interruption of blood supply

,or haemorrhagic, due to rupture of a cerebral artery.

Approximately 85% of strokes are caused by ischaemia and the remainder by haemorrhage.

• The symptoms of brain ischemia may be transient, lasting seconds to minutes, or may persist for longer periods of time.

• Symptoms and signs remain indefinitely if the brain becomes irreversibly damaged and infarction occurs.

An ischaemic stroke can be due to:

- Thrombosis—atherosclerotic disease typically affects the extracranial internal carotid artery but may also affect the vertebral and basilar arteries.

- Embolism—common sources of cardiac emboli are atrial fibrillation, mural thrombus, and valvular heart disease. Typically, emboli involve the territory of large intracerebral arteries, particularly the middle cerebral.

- Systemic hypoperfusion (e.g. due to shock).

- Venous thrombosis—rare cause of stroke due to thrombosis of the dural venous sinuses (e.g. hypercoaguable states, sickle cell disease).

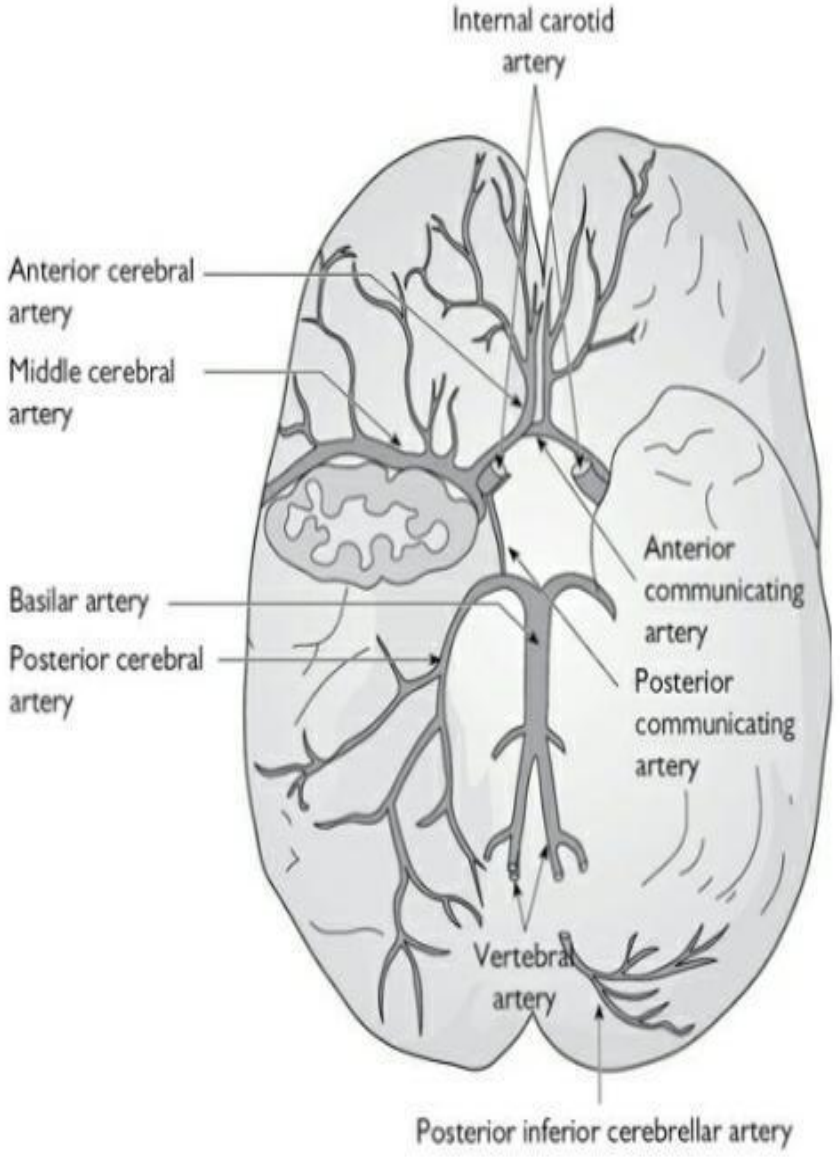
- Carotid artery dissection—rare but should be suspected in patients younger than 50 years old. There is usually a history of ipsilateral head, face, or neck pain.

2022: younger than 30.

- The clinical features of stroke reflect the vascular territory involved

- The anterior circulation is served by the internal carotid arteries, the main branches of which are the middle cerebral artery and anterior cerebralartery.

- The anterior circulation supplies blood to the anterior three-fifths of the cerebrum.

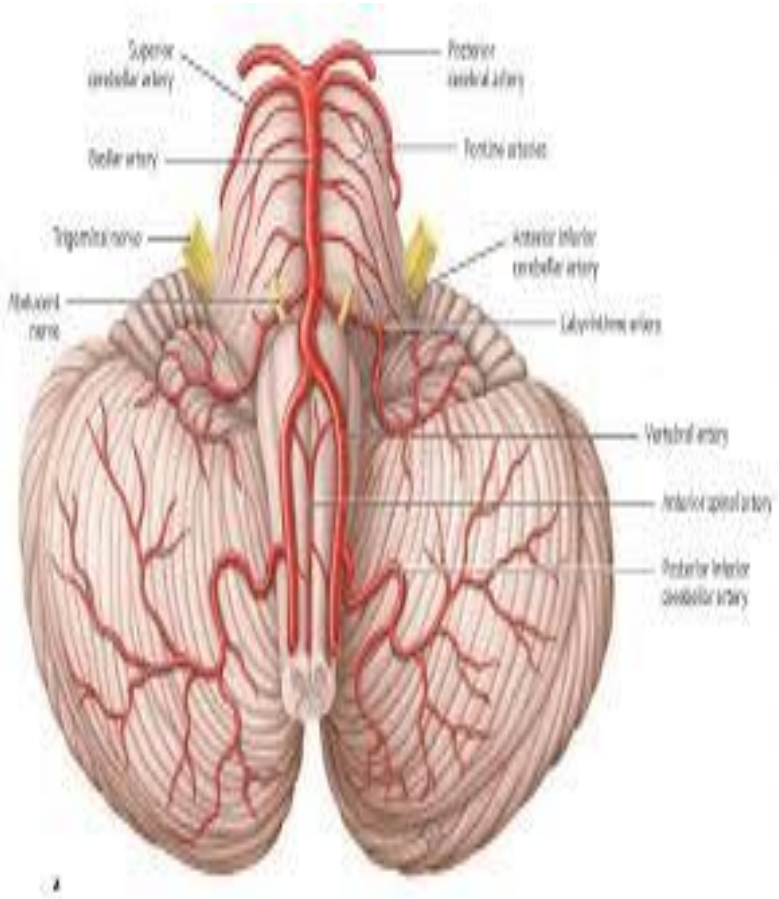


- The posterior circulation is served by the vertebral and basilar arteries.

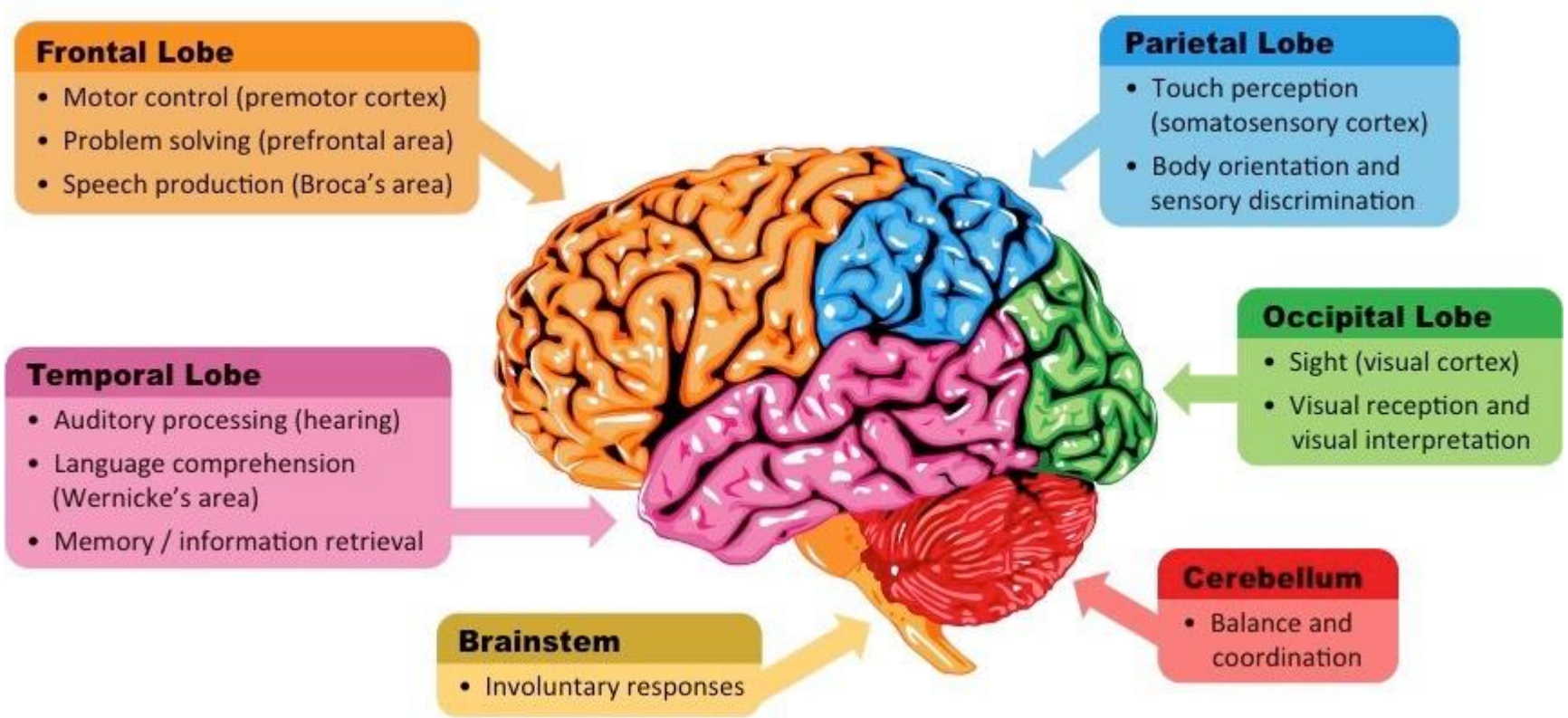
- The vertebra-basilar arteries supply the posterior two-fifths of the cerebrum, part of the cerebellum, and the brainstem.

- The basilar artery gives off the posterior cerebral arteries.

- The anterior and posterior circulations are linked via posterior communicating arteries, forming the circle of Willis .



The doctor didn't mention the details except for the frontal lobe.



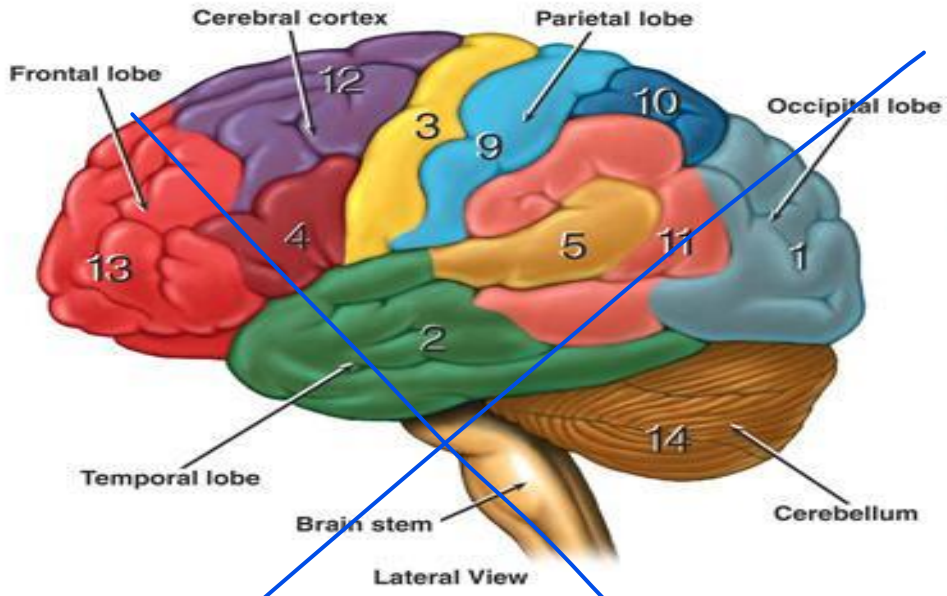
Anatomy and Functional Areas of the Brain

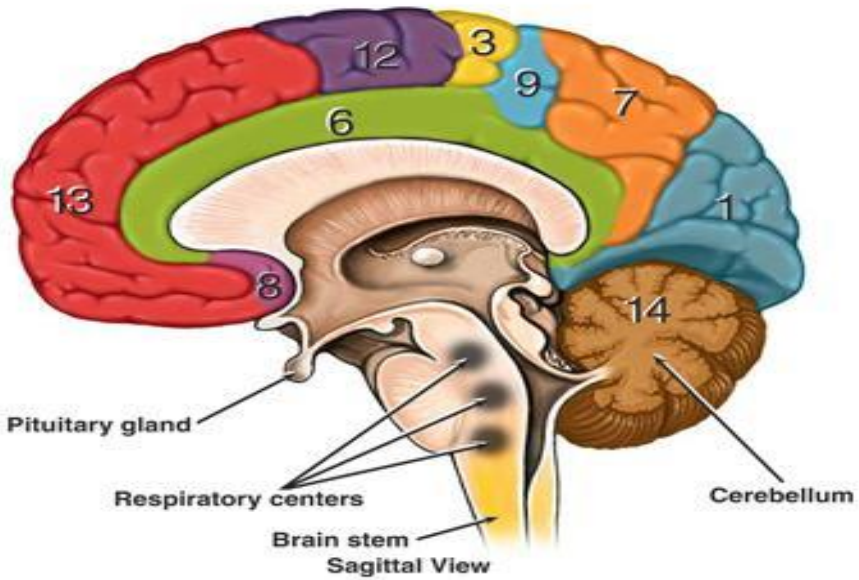
Functional Areas of the Cerebral Cortex

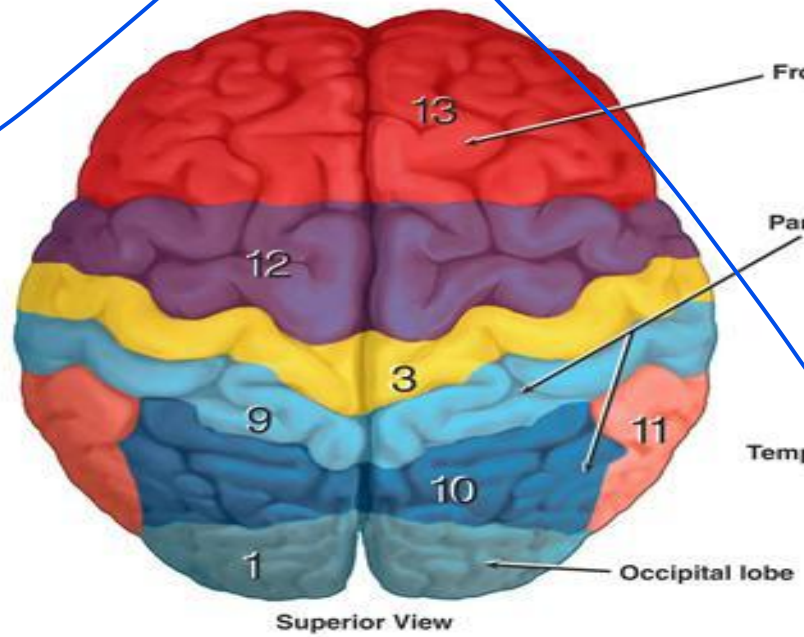
1. **Visual Area:**
   - Sight
   - Image recognition
   - Image perception
2. **Association Area**
   - Short-term memory
   - Equilibrium
   - Emotion
3. **Motor Function Area**
   - Initiation of voluntary muscles
4. **Broca's Area**
   - Muscles of speech
5. **Auditory Area**
   - Hearing
6. **Emotional Area**
   - Pain
   - Hunger
   - "Fight or flight" response
7. **Sensory Association Area**
8. **Olfactory Area**
   - Smelling
9. **Sensory Area**
   - Sensation from muscles and skin
10. **Somatosensory Association Area**
    - Evaluation of weight, texture, temperature, etc. for object recognition
11. **Wernicke's Area**
    - Written and spoken language comprehension
12. **Motor Function Area**
    - Eye movement and orientation
13. **Higher Mental Functions**
    - Concentration
    - Planning
    - Judgment
    - Emotional expression
    - Creativity
    - Inhibition

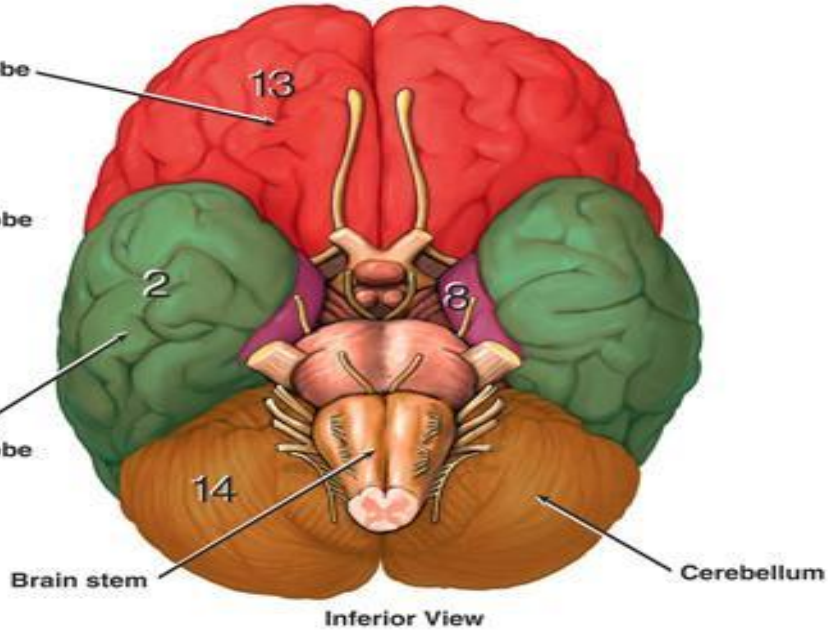
Functional Areas of the Cerebellum

14. **Motor Functions**
    - Coordination of movement
    - Balance and equilibrium
    - Posture









Arterial territory	Clinical features
Middle cerebral artery MCA is the most common.	Contralateral motor deficit (weakness of the face and arm is greater than the leg) Contralateral sensory deficit Gaze deviated towards side of lesion If dominant hemisphere involved—receptive/expressive dysphasia If non-dominant hemisphere involved—neglect/inattention
Anterior cerebral artery	If non-dominant hemisphere involved—neglect/inattentionAnterior cerebral artery Disinhibition Speech preservation Altered mental status Contralateral motor deficit (weakness in leg greater than arm) Contralateral cortical sensory
Posterior cerebral artery	Visual disturbance Contralateral homonymous hemianopia Impaired memory
Vertebrobasilar artery	Cerebellar signs (intention tremor, dysdiadochokinesia, nystagmus, and ataxia) Vertigo ,Dysarthria , Visual field defects, diplopia ,Syncope , Ipsilateral cranial nerve deficits , Contralateral motor deficit

Recognition of stroke: Distinguishing acute stroke from ‘stroke mimics’ is vitally important in the ED to ensure prompt and appropriate treatment.

Stroke mimics include:

- Seizures (e.g. with Todd’s paresis)
- Space-occupying lesions (primary or secondary cerebral tumours)
- Hypoglycaemia Hypoglycemia< you should always check the patient's blood sugar.
- Subdural haemorrhage
- Cerebral abscess , Encephalitis , Cerebral vasculitis (e.g. temporal arteritis)
- Migraine
- Spinal cord lesions
- Sepsis (may exacerbate old neurological signs)
- Delirium ,Dementia
- Vestibular pathology
- Mononeuropathies
- Functional disorders

الدكتور قرأ اكمن نقطة مو كلهم، ونفس الاشي للاشياء المشابهة

Two formal assessment tools for the recognition of stroke are commonly used in pre-hospital medicine and the ED; these are the face arm speech test (FAST) and the Recognition of Stroke in the Emergency Room (ROSIER) scale.

The face arm speech test -The FAST scale is predominantly used by the ambulance service to identify patients suffering from an acute stroke.

- It is also suitable for use by the general public.

The face arm speech test is composed of three equally weighted clinical signs:

- Facial asymmetry: 1 point
- Arm (or leg) weakness: 1 point
- Speech disturbance: 1 point

A stroke should be suspected if any of these signs are present (score >0). The sensitivity for stroke is 82% and specificity 83%.

- The ROSIER scale is designed for ED use.
- It comprises two negative predictive symptoms, to help screen for stroke mimics, and five positive predictive symptoms
- The total score range is –2 to + 5. Stroke is likely if the score ≥1, in the absence of hypoglycaemia.
- The sensitivity for stroke diagnosis is 93% and specificity 83%.

Negative predictive symptoms	Positive predictive symptoms
Loss of consciousness or syncope? Yes: –1 point Seizure activity? Yes: –1 point.	New acute onset: • Asymmetric facial weakness? Yes: + 1 point • Asymmetric arm weakness? Yes: +1 point • Asymmetric leg weakness? Yes: + 1 point • Speech disturbance? Yes: + 1 point • Visual field defect? Yes: +1 point

Investigations for acute stroke

Brain imaging :

Brain imaging should be performed immediately (i.e. the next available slot and definitely within one hour) for patients with acute stroke, if any of the following apply:

- contra-Indications for thrombolysis or early anticoagulation treatment
- On anticoagulant treatment
- A known bleeding tendency
- A depressed level of consciousness
- Unexplained or fluctuating symptoms
- Papilloedema, neck stiffness, or fever
- Severe headache at onset of stroke symptoms

- For patients without an immediate indication, brain imaging should be performed as soon as possible (i.e. within 24 hours).

- Typically in the ED, a non-contrast CT scan is the most commonly used brain imaging technique. The main goal of the CT is to exclude intracerebral hemorrhage. (docotr said it should be done in the first hour)

- This can help exclude an intracerebralhaemorrhage or important mimics, such as brain metastases. However, the sensitivity for detection of ischaemia is low in the very early stages of stroke.

- Some hospitals may offer MRI scanning, which has a greater sensitivity for early ischaemia.

• Blood glucose—is paramount and the most useful bedside test to exclude an easily reversible stroke mimic. Blood glucose should be maintained between 4 and 11 mmol/L.

• Clotting—should be checked if the patient is on anticoagulants. Urgent reversal will be required if imaging reveals an intracranial bleed.

• ECG—may suggest a cardiac origin for thrombus (e.g. atrial fibrillation).

Rare.

• ESR—may suggest a vasculitic cause.

• Other investigations, such as FBC, U&E, lipids, and CXR, should be requested but are unlikely to alter the acute ED management.

Management in ER

- Air way protection , correct hypoxia, hypo/hyperglycemia, avoid aspiration , maintain normothermia

- Control BP avoid hypotension and consider usage of CCB ((nimodipin , nicardipine) ,ACEI m ,GTN for hypertension

Avoid hypotension to maintain high cerebral perfusion pressure, so the ischemic area will not increase in size.

- ASA 300 early and daily for 2 weeks if not HMG , add dipyradamol 200 *2 for TIA

- No role for heparin

In the end, the patient will go either to the floor or to the ICU. (Remember to check for the GAG reflex.)

Thrombolysis

- **Indication ::**
- Clear time of onset and presentation within 4.5 hours
- Sign and symptoms consistent with acute stroke
- No contra indication
- **Dose :**
- Alteplase 0.9mg/kg as infusion over 60 min ((first 10% given as a bolus))

Contraindication

- From image :
- HMG
- MCA territory of ischemic change is moe than 1/3
- Extensive small vessel dis

- From history

1. Stroke or head injury in last 3 months
2. Major surgery or trauma in 14 days
3. Previous ICH , or SAH
4. Seziure with stroke
5. GI bleeding or UT bleeding in last 21 days
6. Recent LP or art puncture in non compressible site
7. Heparin within 2says

- From labs

1. Plt less than 100
2. Inr more than 1.7
3. Hypoglcemnia
4. Hb less than 10

- Form examination

Rapidlly improve

Bp > 185/110

- A transient ischaemic attack is defined as stroke symptoms and signs that resolve within 24 hours.

- Transient ischemic attack (TIA) is defined as a transient episode of neurologic dysfunction caused by focal brain, spinal cord, or retinal ischemia, without acute infarction.

ABCD2 score A substantial risk of stroke exists in the early period after TIA. The most commonly used risk stratification tool is the ABCD2 score, which is recommended by NICE

Characteristics		ABCD SCOR
Age	≥60 years	1 point
Blood pressure	≥140/90 mmHg	2 point
clinical	Focal weakness Speech disturbance without weakness	2 point 1 point
Duration	≥60 minutes 10–59 minutes	2 point 1 point
Diabetes		1 point

Table 11.16 Risk of future stroke based on ABCD^2 score

ABCD2 score	Risk of stroke		
	2 days	7 days	90 days
0–3 (low risk)	1%	1.2%	3.1%
4–5 (moderate risk)	4.1%	5.9%	9.8%
6–7 (high risk)	8.1%	11.7%	18%

Emergency department management of transient ischaemic attacks

- All patients with TIA should be immediately started on aspirin 300 mg daily.
- The risk of subsequent stroke should be assessed using the ABCD2 score.
- Patients with an ABCD2 score of 4 or greater should have specialist assessment within 24 hours of symptom onset.
- Patients with crescendo TIA (two or more TIAs in a week) should have specialist assessment within 24 hours of symptom onset.
- Patients with an ABCD2 score of 3 or below should have specialist assessment within one week of symptom onset.

- Patients presenting more than one week after symptoms have resolved should have specialist assessment within one week of presentation.

- Measures for secondary prevention should be introduced as soon as the diagnosis is confirmed (e.g. lipid lowering therapy, antihypertensives, treatment of diabetes, management of AF, and lifestyle advice).

- Patients who are discharged from the ED should be advised that they cannot drive for at least one month. They may resume driving after this period if clinical recovery is satisfactory.

Imaging for transient ischaemic attacks

- Not all patients suffering a TIA require brain imaging. Patients should have specialist assessment before a decision on imaging is made.

- Patients who have a suspected TIA, in whom the vascular territory or pathology is uncertain, should undergo brain imaging (preferably a diffusion weighted MRI).

- Patients at a high risk of stroke (e.g. ABCD2≥4 or crescendo TIA), who require imaging, should have this done within 24 hours of symptom onset

- Patients at lower risk of stroke (ABCD2≤3), who require imaging, should have this done within one week of symptom onset.

- Brain imaging may also be helpful for patients being considered for carotid endarterectomy where it is uncertain if the stroke is in the anterior or posterior circulation

- Carotid imaging is required to determine the presence and severity of carotid stenosis in those patients who may be appropriate for carotid endarterectomy (i.e. those with a TIA involving the anterior circulation who are fit and willing for surgery.

- NICE recommend that carotid imaging is performed within one week of symptom onset).