Stroke: clinical presentations, symptoms and signs

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EAN teaching course
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World Stroke Organization

World Stroke Academy

Clinical diagnosis is important to

- **Ensure stroke patients arrive in stroke unit**
  - General public should be able to recognise stroke
  - Treatment of mimics (seizures, tumours, infection) very different
- **Assess the neurological deficits**
  - Immediate management
  - Predict prognosis and plan discharge
  - Identify problems early (e.g. swallowing difficulty)
- **Decide management while waiting for results**
- **Interpret brain scan result**
  - Is scan consistent with clinical diagnosis?
  - If not, reconsider the diagnosis

First step: educate public

Stroke Warning Signs and Symptoms

What is the definition of stroke?

A *clinical* syndrome characterised by rapidly developing clinical symptoms with

- signs of **focal** cerebral loss of function.
- symptoms lasting more than 24 hours or leading to death (if < 24h = TIA).
- with no apparent cause other than that of vascular origin.

Take a narrative history from patient or family: was onset sudden?

- Where were you?
- What were you doing?
- What did you first notice wrong?
- When were you last completely free of symptoms?
- Then what happened?

Photo courtesy Rufus Akinyemi

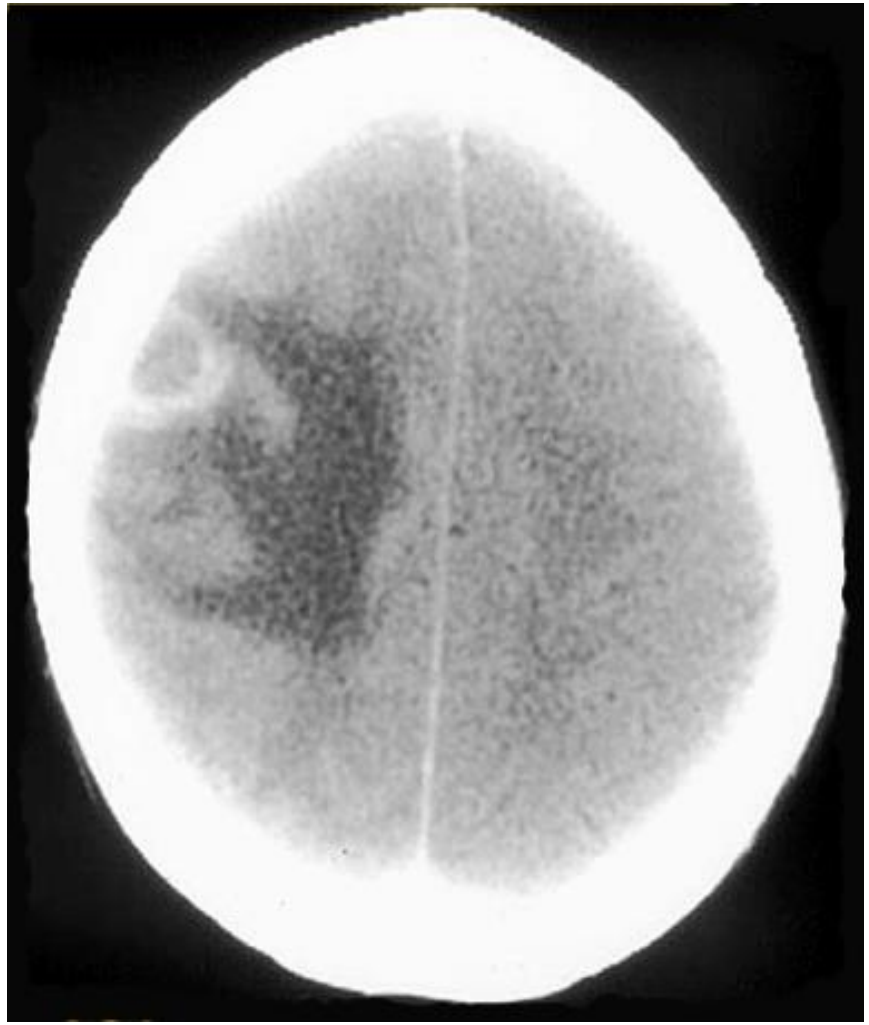
Good history is vital!

- Get the time of onset wrong and you will make an incorrect decision about thrombolysis (which must be given < 4.5 hours of onset)

- In patients with confusion, coma or aphasia, the story from a witness / the family is as important as a scan

Was onset really sudden?

- 75 year old man who lives alone
- His daughter visits from another city and finds him unable to speak
- O/E aphasia only
- Family doctor diagnoses mild stroke
- Neighbour says he has had increasing difficulty with speech over past few weeks



CT scan shows left hemisphere tumour

Are the symptoms FOCAL ?

- Unilateral weakness of face, arm, leg
- Sudden speech disturbance
  - Dysphasia (talking nonsense)
  - Dysarthria (slurred speech)
- Visual loss (hemianopia)
- Cerebellar features (dysarthria and ataxia) – ‘sounds drunk, looks drunk’

Warlow et al Practical Management of Stroke 3rd ed

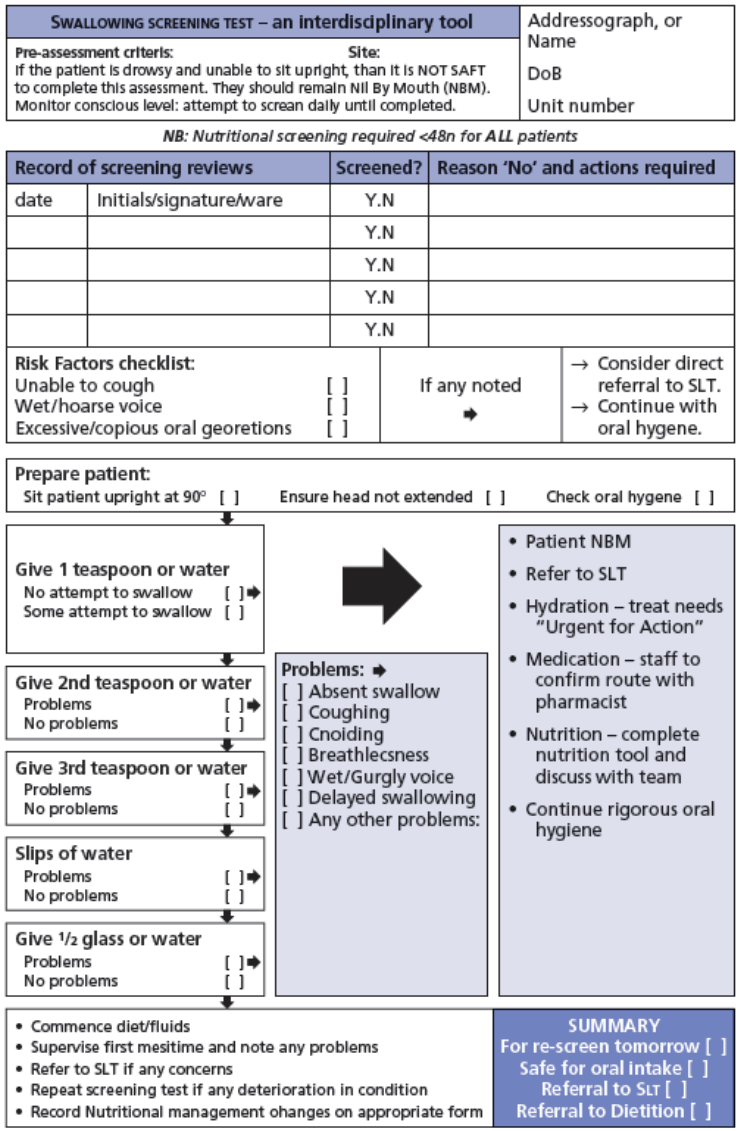
Non-focal symptoms = NOT stroke

- Generalized weakness and/or sensory disturbance
- Light-headedness or faintness (pre-syncope)
- Brief loss of consciousness
- Incontinence of urine or faeces
- Confusion
- Ringing in the ears (tinnitus)

Warlow et al Practical Management of Stroke 3rd ed

Assess stroke severity and swallowing

- Conscious level: Glasgow Coma Scale
  - Eye opening
  - Best verbal response
  - Best Motor Response
- NIH Stroke Scale
  - 0-4 Mild stroke
  - 5-15 moderate stroke
  - 15-40 severe stroke
- Can patient swallow safely?
  - '3 teaspoon test'
  - If unsafe: NIL BY MOUTH



SWALLOWING SCREENING TEST – an interdisciplinary tool

Addressograph, or Name
DoB
Unit number

Pre-assessment criteria: **Site:**
If the patient is drowsy and unable to sit upright, than it is NOT SAFT to complete this assessment. They should remain Nil By Mouth (NBM).
Monitor conscious level: attempt to screan daily until completed.

NB: Nutritional screening required <48n for ALL patients

Record of screening reviews		Screened?	Reason 'No' and actions required
date	Initials/signature/ware	Y.N	
		Y.N	
		Y.N	
		Y.N	
		Y.N	

Risk Factors checklist:
Unable to cough [ ]
Wet/hoarse voice [ ]
Excessive/copious oral georetions [ ]

If any noted ➡

→ Consider direct referral to SLT.
→ Continue with oral hygene.

Prepare patient:
Sit patient upright at 90° [ ] Ensure head not extended [ ] Check oral hygene [ ]

Give 1 teaspoon or water
No attempt to swallow [ ]➡
Some attempt to swallow [ ]

Give 2nd teaspoon or water
Problems [ ]➡
No problems [ ]

Give 3rd teaspoon or water
Problems [ ]➡
No problems [ ]

Slips of water
Problems [ ]➡
No problems [ ]

Give ½ glass or water
Problems [ ]➡
No problems [ ]

Problems: ➡
[ ] Absent swallow
[ ] Coughing
[ ] Cnoiding
[ ] Breathlecsness
[ ] Wet/Gurgly voice
[ ] Delayed swallowing
[ ] Any other problems:

- Patient NBM
- Refer to SLT
- Hydration – treat needs "Urgent for Action"
- Medication – staff to confirm route with pharmacist
- Nutrition – complete nutrition tool and discuss with team
- Continue rigorous oral hygiene

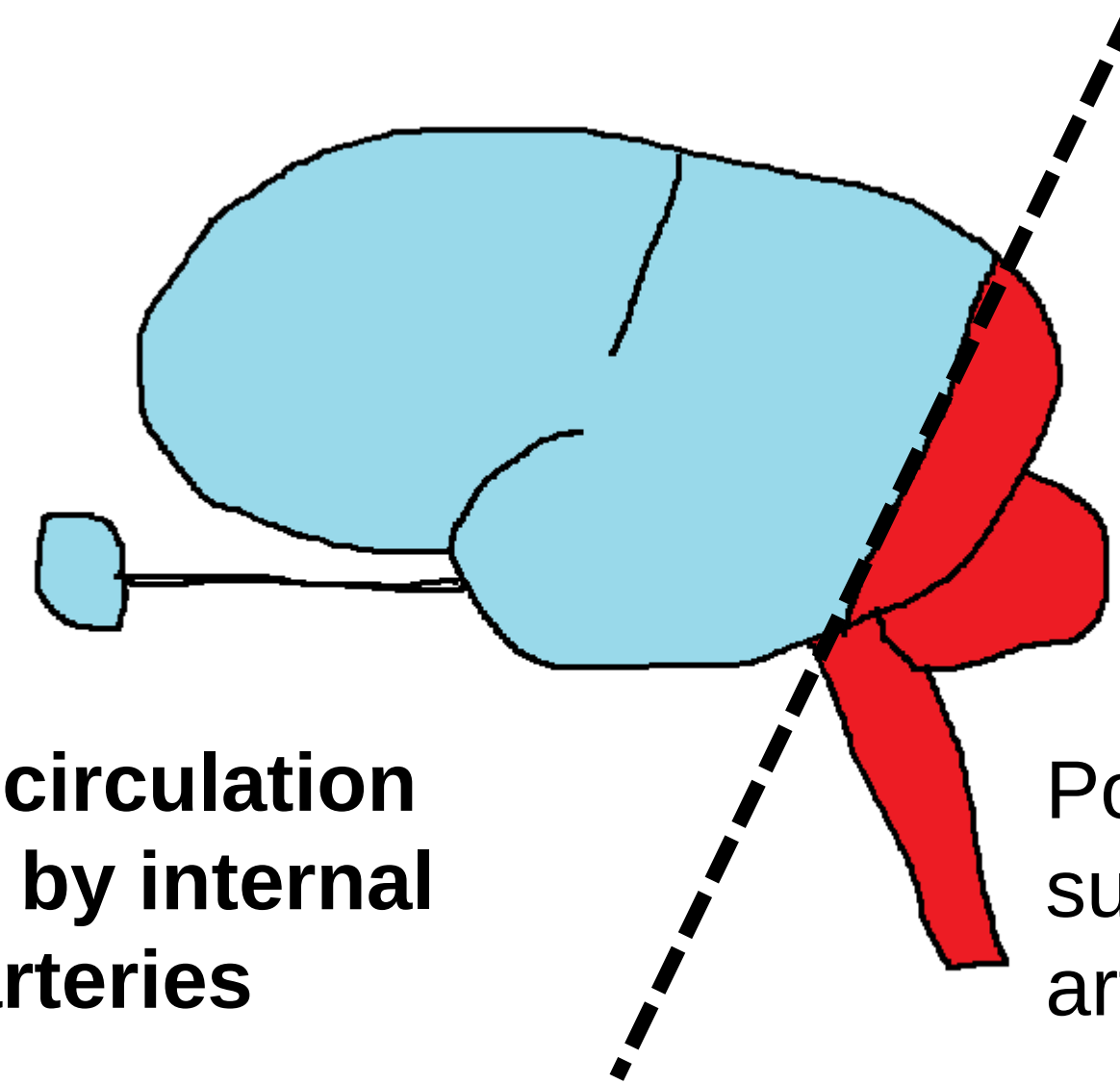
- Commence diet/fluids
- Supervise first mesitime and note any problems
- Refer to SLT if any concerns
- Repeat screening test if any deterioration in condition
- Record Nutritional management ohanges on appropriate form

SUMMARY
For re-screen tomorrow [ ]
Safe for oral intake [ ]
Referral to SLT [ ]
Referral to Dietition [ ]

Does the clinical deficit conform to a vascular territory?

Size and location of lesion and pattern of symptoms will depend on location and size of artery affected

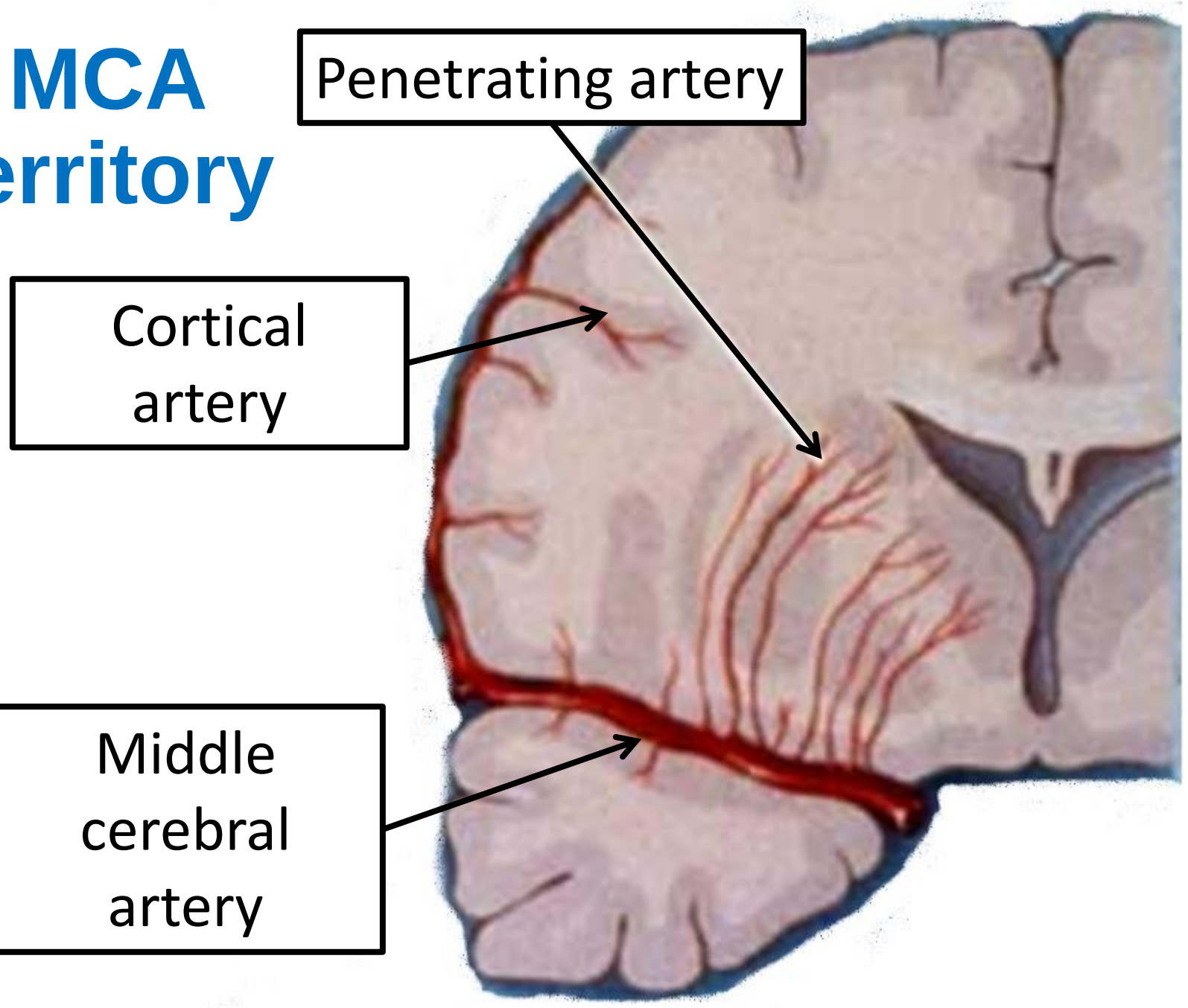
Blood supply to the brain & eye



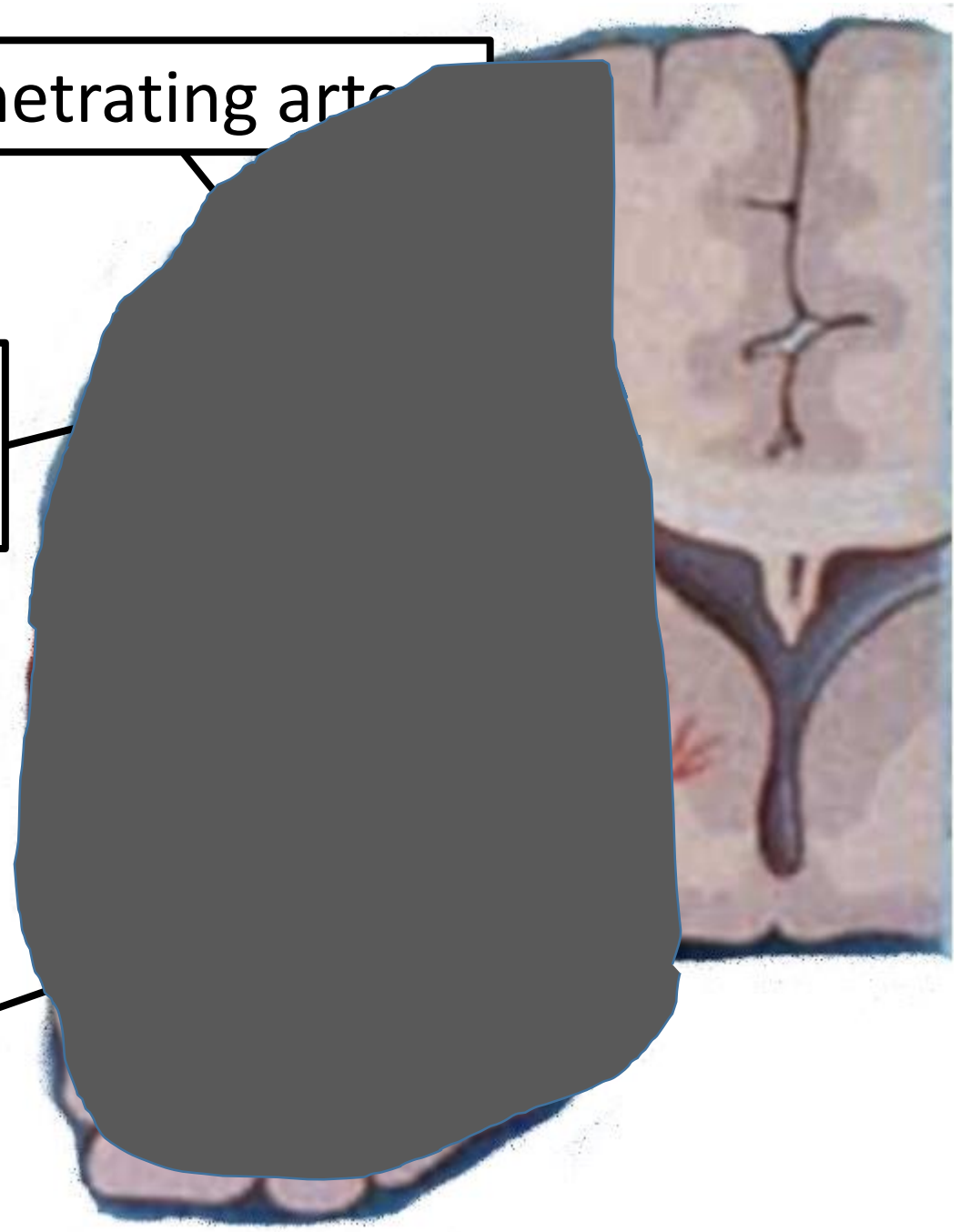
Anterior circulation supplied by internal carotid arteries

Posterior circulation supplied by vertebral arteries

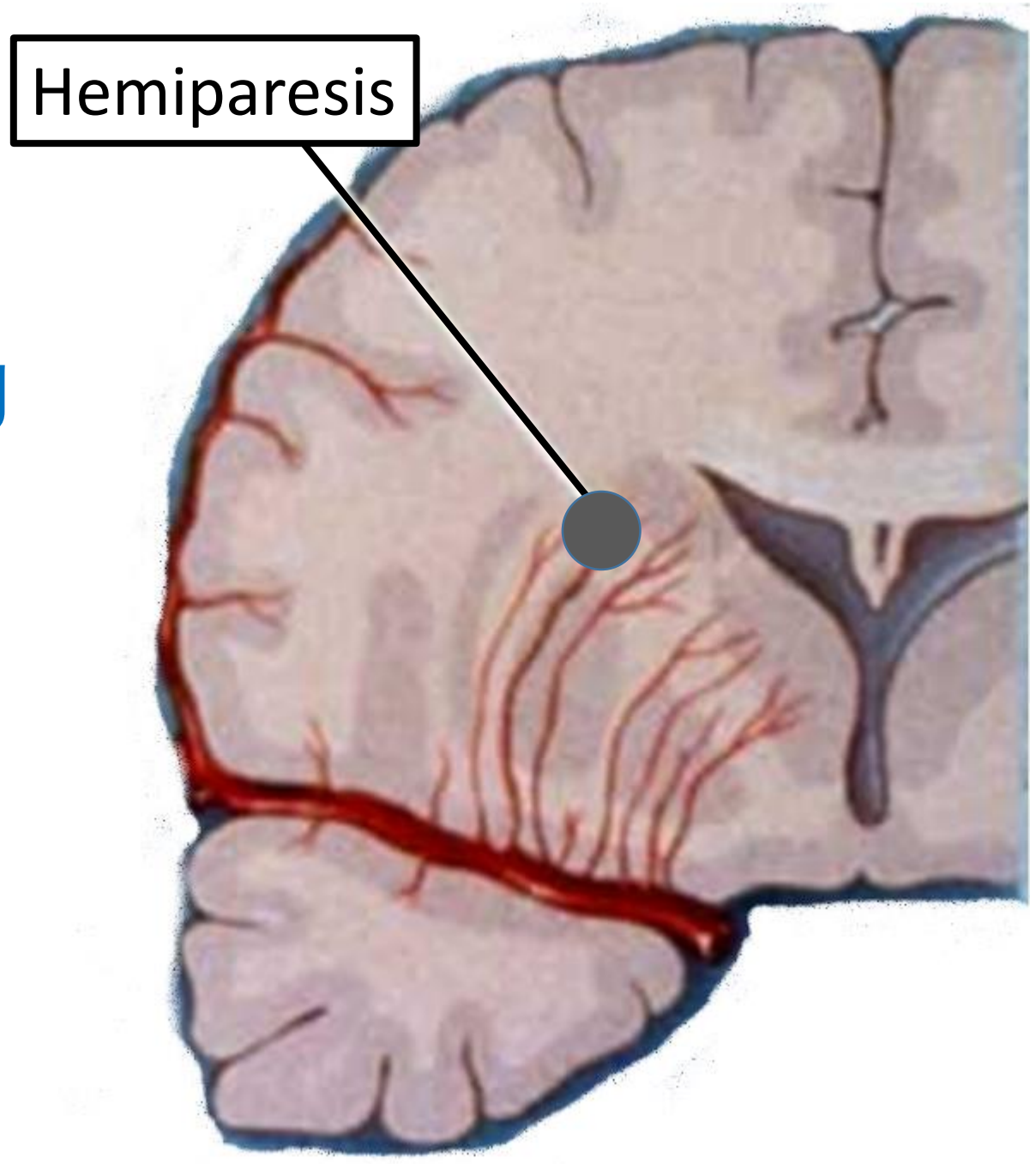
MCA territory



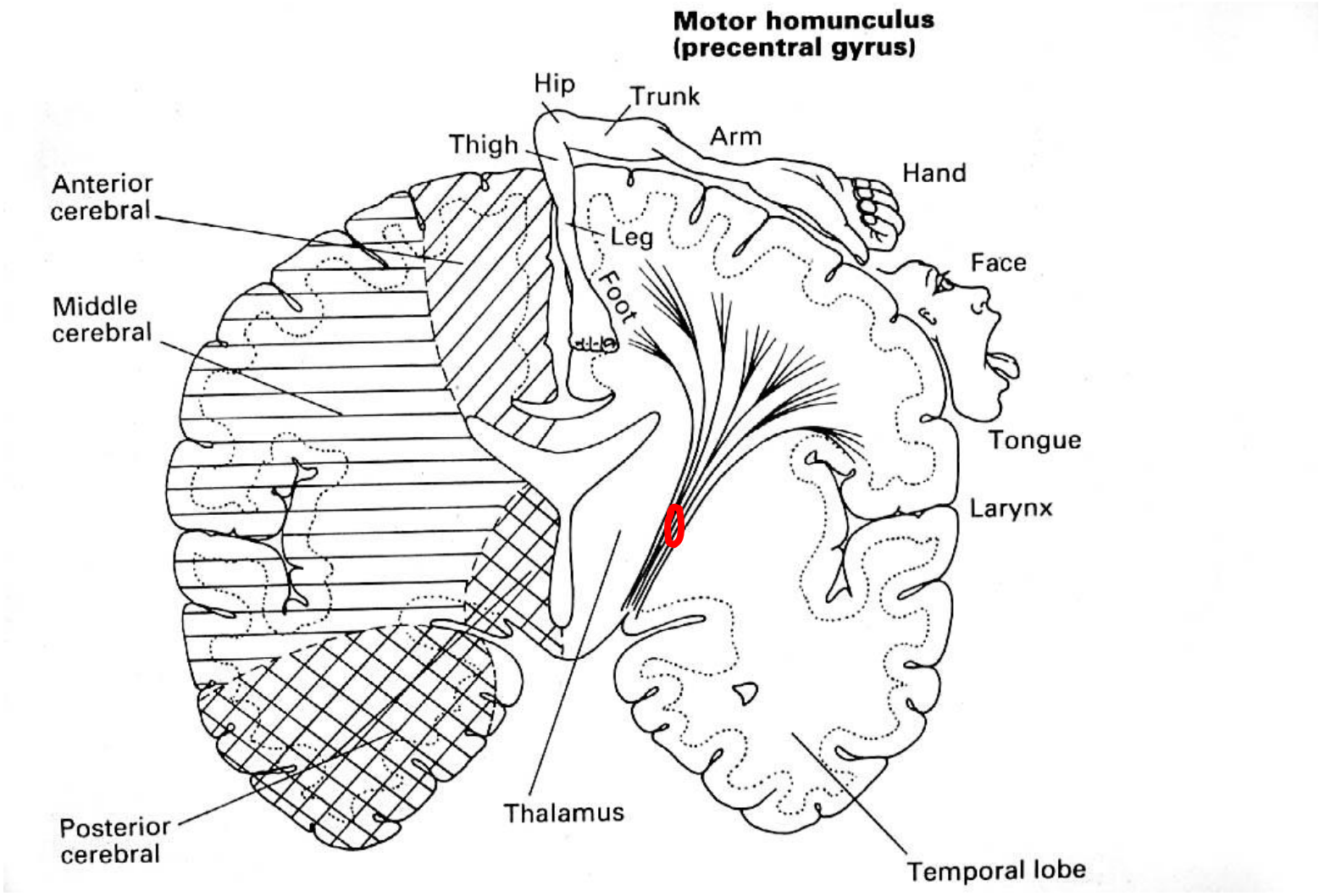
MCA territory



MCA territory. Small perforating artery



Stroke in internal capsule, though very small can cause motor weakness in face, arm & leg: hemiplegia

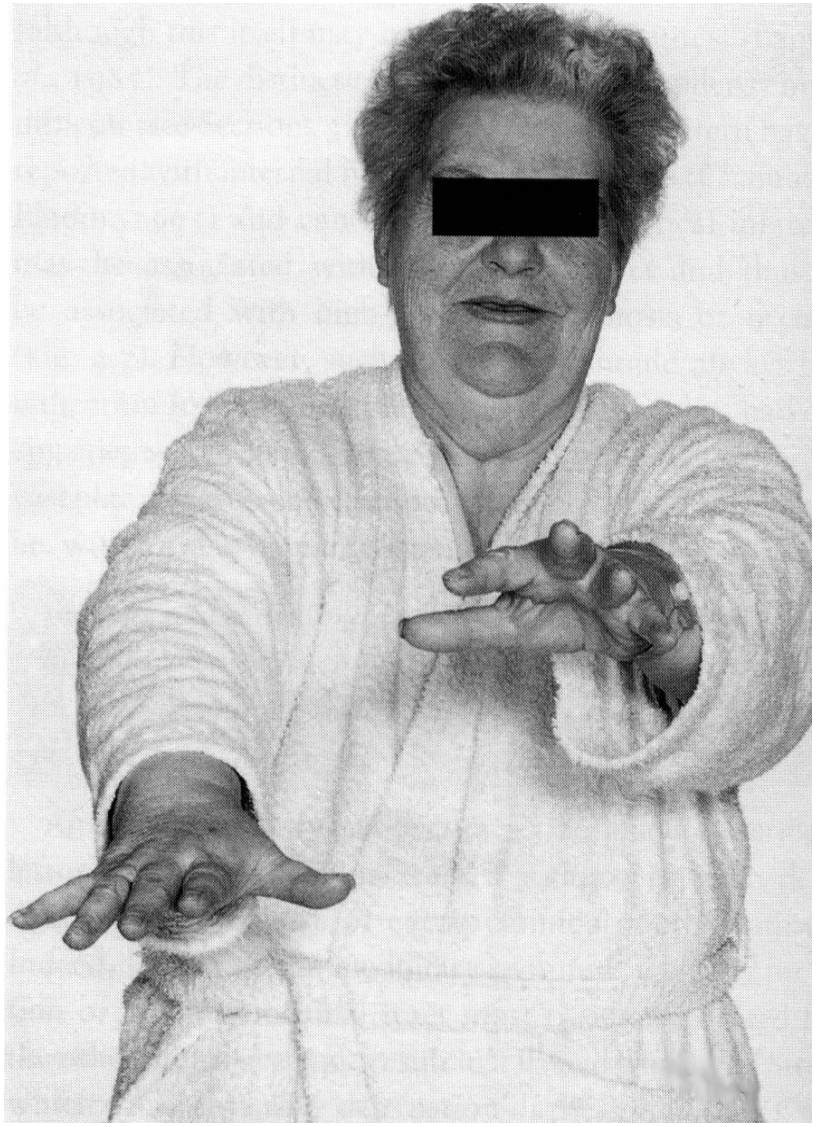


Small (lacunar) internal capsule infarct on CT

MCA territory: cortical branch

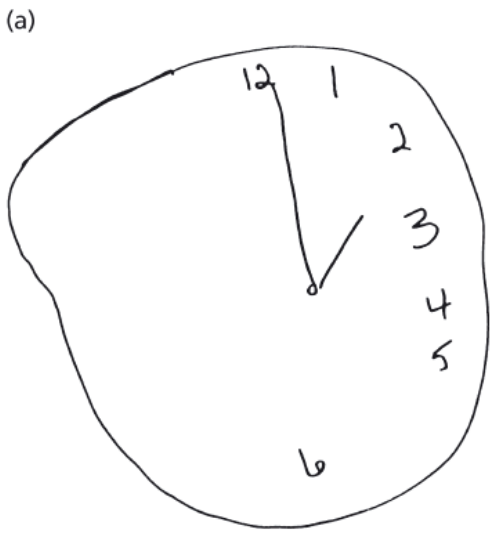
Aphasia or visuospatial disorder or monoparesis only

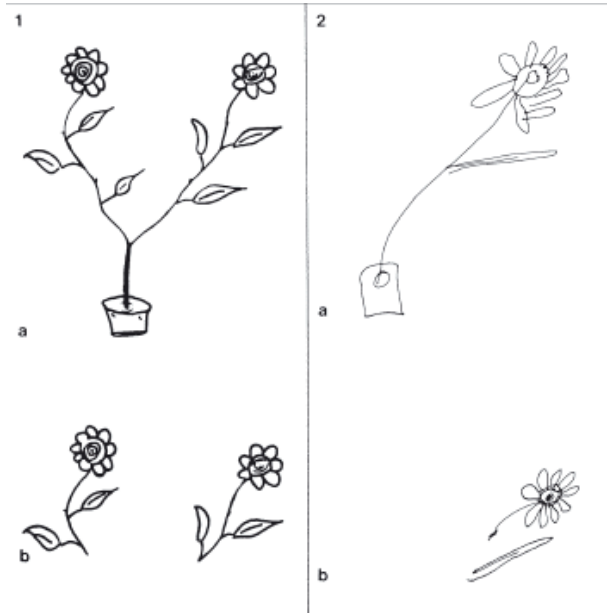
Effect: monoparesis (weakness of one arm)



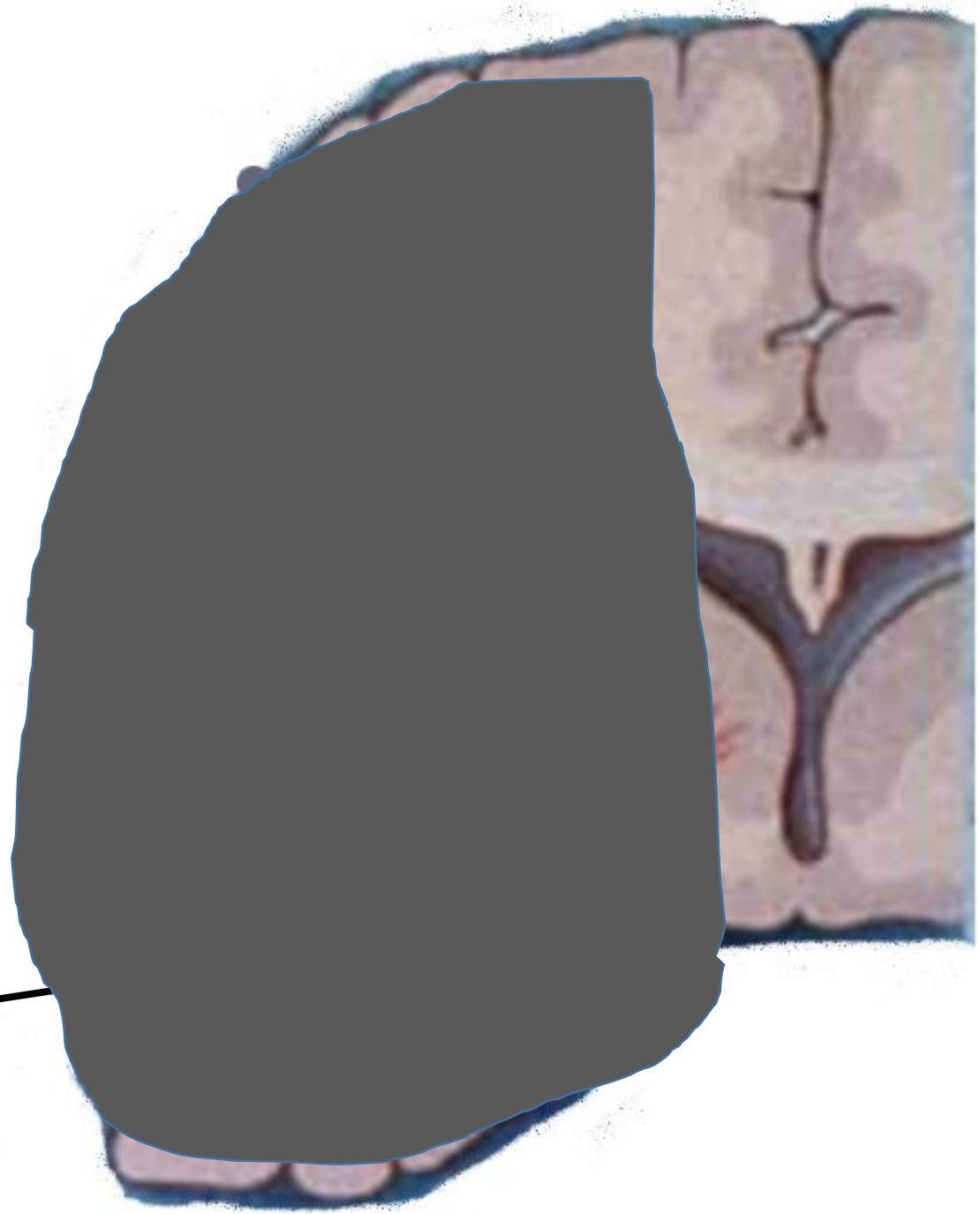
Infarction of cortical branch of MCA territory (e.g. arm area of motor cortex)

Visuospatial disorder = neglect with right (non-dominant) hemisphere cortical infarct





MCA territory: whole territory



Hemiplegia +
Aphasia+
Hemianopia

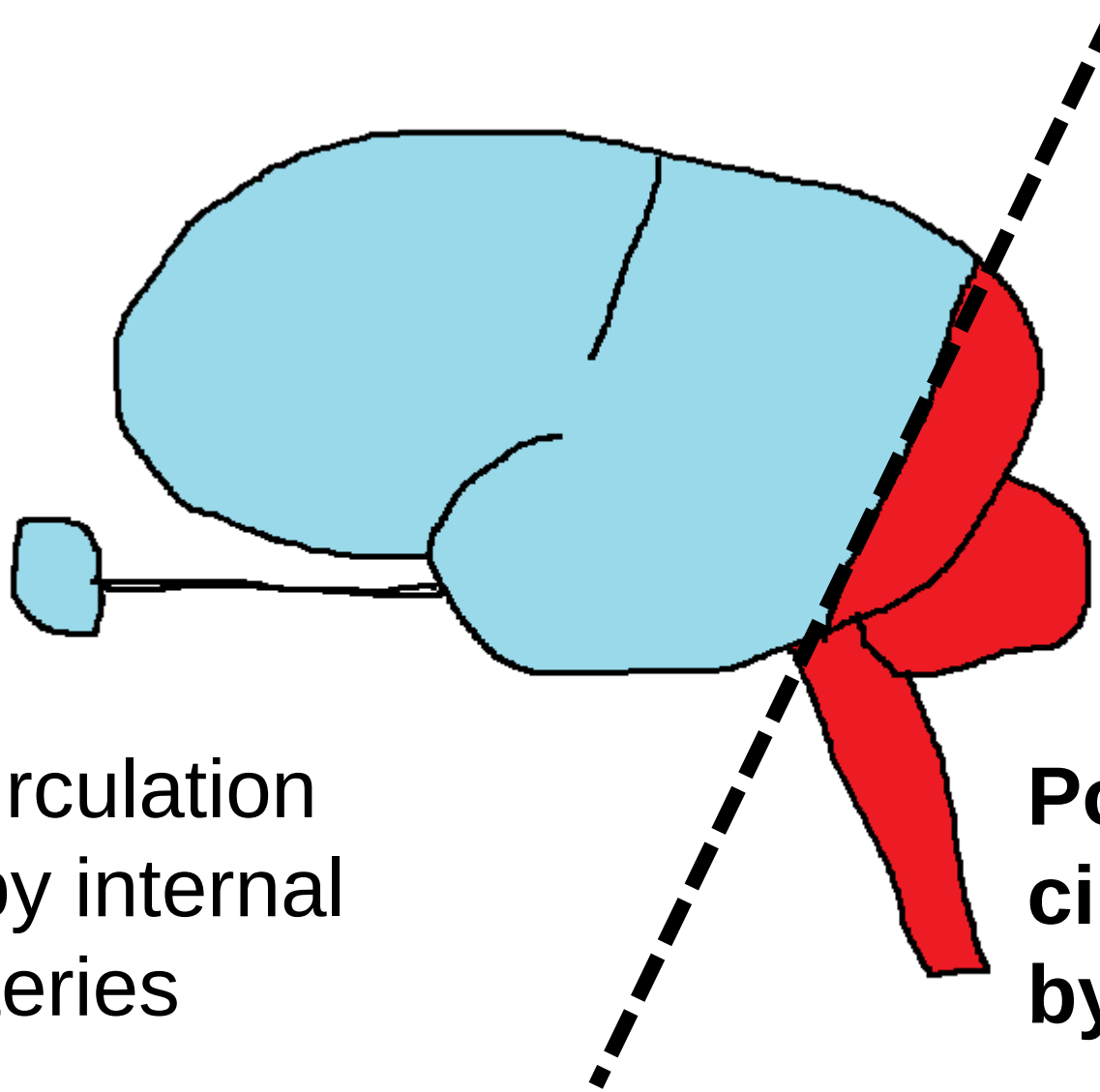
Effect: devastating – 90 % chance of death or disability

Damage to speech area in L hemisphere -> loss of speech (aphasia)

Damage to L visual pathway->
Loss of vision to R (Hemianopia)

Damage to left motor cortex and internal capsule ->
Weakness of R face, arm and leg

Blood supply to the brain & eye



Anterior circulation supplied by internal carotid arteries

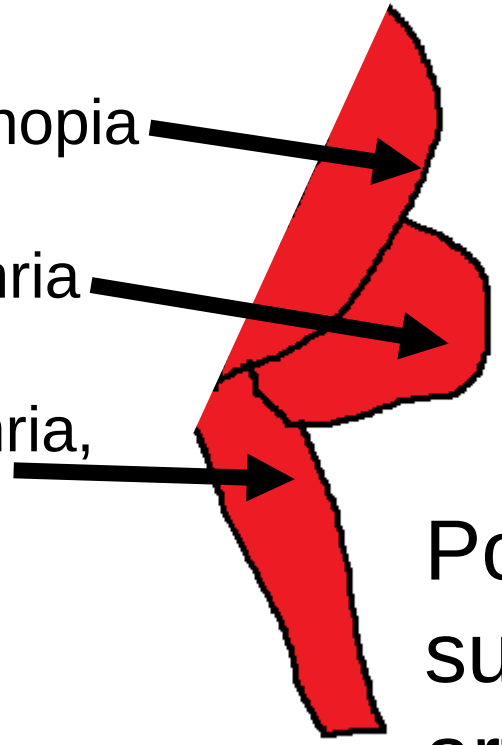
Posterior circulation supplied by vertebral arteries

Neurological deficits from posterior circulation stroke

Occipital cortex – hemianopia

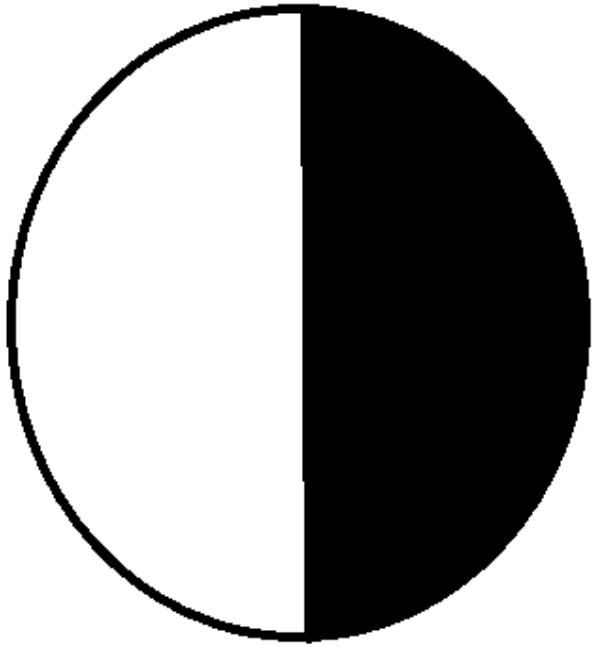
Cerebellum – ataxia, dysarthria

Midbrain, pons, medulla – diplopia, dysarthria, dysphagia, quadriparesis

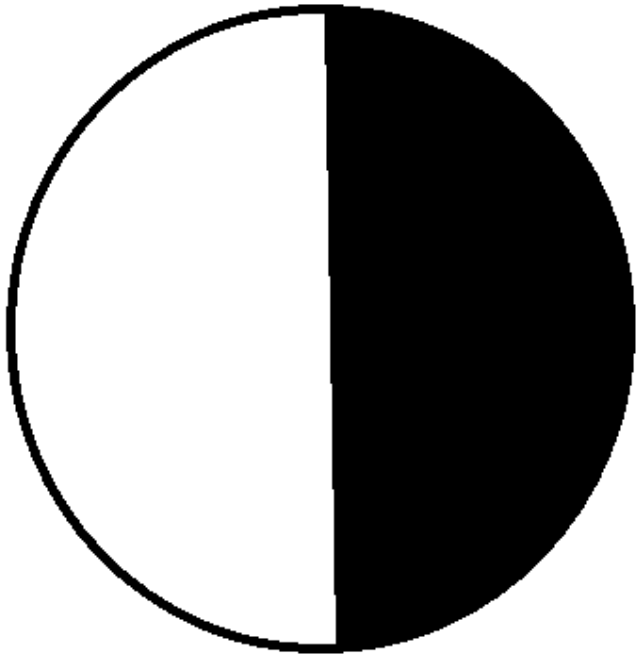


Posterior circulation supplied by vertebral arteries

Right homonymous hemianopia



Left eye



Right eye

Posterior cerebral territory infarct: infarction of left visual cortex -> loss of vision in the right visual field

CT scanning in acute stroke

Cerebral infarction

Scan often normal very early after onset of ischaemic stroke. Hyperdense artery = clot blocking artery

Thrombolysis OK

Subtle hypodensity = early ischaemic change

Thrombolysis OK

Severe hypodensity

Too late for Thrombolysis

Intracerebral haemorrhage

thrombolysis contraindicated

Summary: diagnosis of stroke

- Clear history of ***sudden*** onset
- Patient must have a ***focal*** neurological deficit
- Symptoms and signs conform to a ***vascular territory***
- Make a ***clinical*** diagnosis ***before*** you scan
- CT scan
  - Appearance of ischaemic lesion ***must match***
    - ***Clinical localisation*** of lesion
    - Degree of hypodensity should match ***duration of symptoms***
  - May be normal
    - in first few hours after onset
    - in mild ischaemic stroke

Further reading (copies available from me)

- William Howlett. Neurology in Africa, Chapter 5 (stroke)
- Diagnosis and classification of stroke. Warlow et al Practical management of Stroke Chapters 3&4

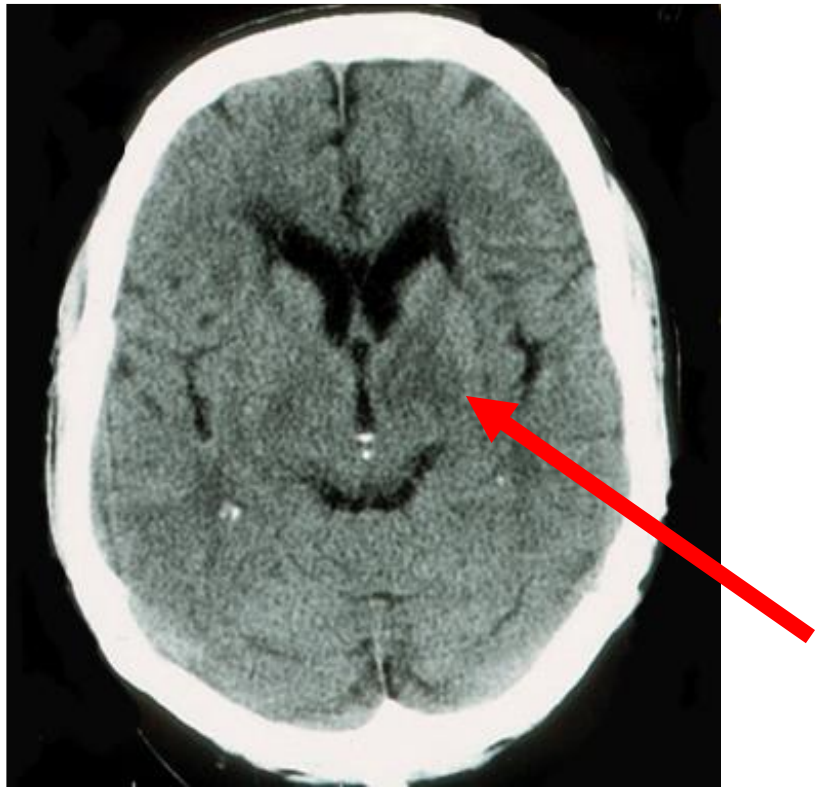
- On-line (free) training in CT scan interpretation http://apps.neuroimage.ed.ac.uk/access/

Arterial territory and clinical deficit

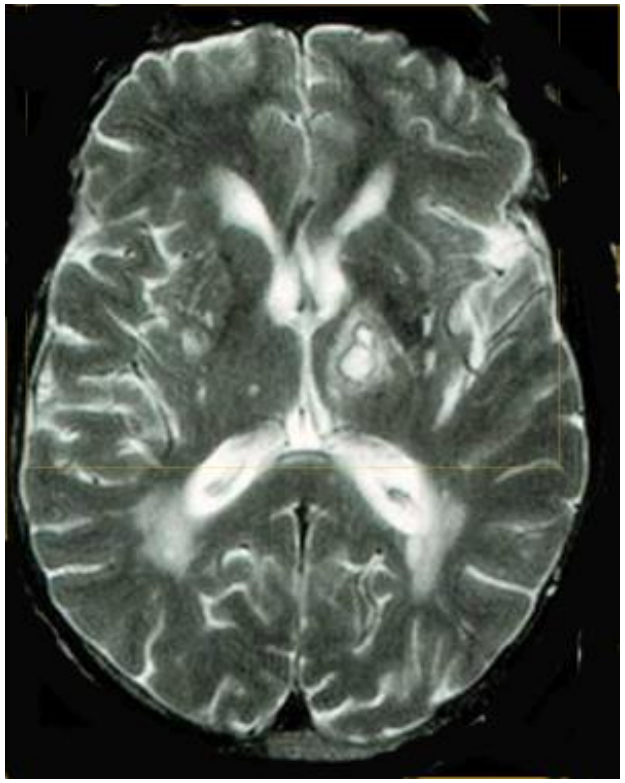
Artery	Main clinical findings
Internal carotid artery	hemiplegia, (arm = face = leg) hemisensory deficit hemianopia
Anterior cerebral artery	hemiplegia, (leg > arm)
Middle cerebral artery	hemiplegia & numbness (face = arm > leg) aphasia *(if the dominant hemisphere involved)* hemianopia sensory inattention *(if the non dominant hemisphere involved)*
Posterior cerebral artery	hemianopia
Lacunar	hemiplegia, (face = arm = leg) hemisensory, (face = arm = leg)
Vertebro-basilar arteries (brain stem)	dysphagia, dysarthria, hemiplegia/quadriplegia cranial nerve palsies ataxia

Howlett. Neurology in Africa

If CT delayed CT > 4 days after onset, it cannot reliably differentiate infarct and haemorrhage



10 days after onset of right hemiplegia, CT suggests infarction left basal ganglia



MR shows stroke was due to intracerebral haemorrhage

Free membership of WSO

- All attendees will be contacted by WSO after conference and offered 1 year membership free
- Free on-line access to
  - International Journal of Stroke
  - World Stroke Academy
  - Newsletters
  - Option to Join Young Stroke Professionals Group

Training on-line

- NIHSS www.NIHSS.com
- Training in CT interpretation http://thalia.dcn.ed.ac.uk/
- Basic acute care (including swallow assessment) http://www.stroketraining.org/