

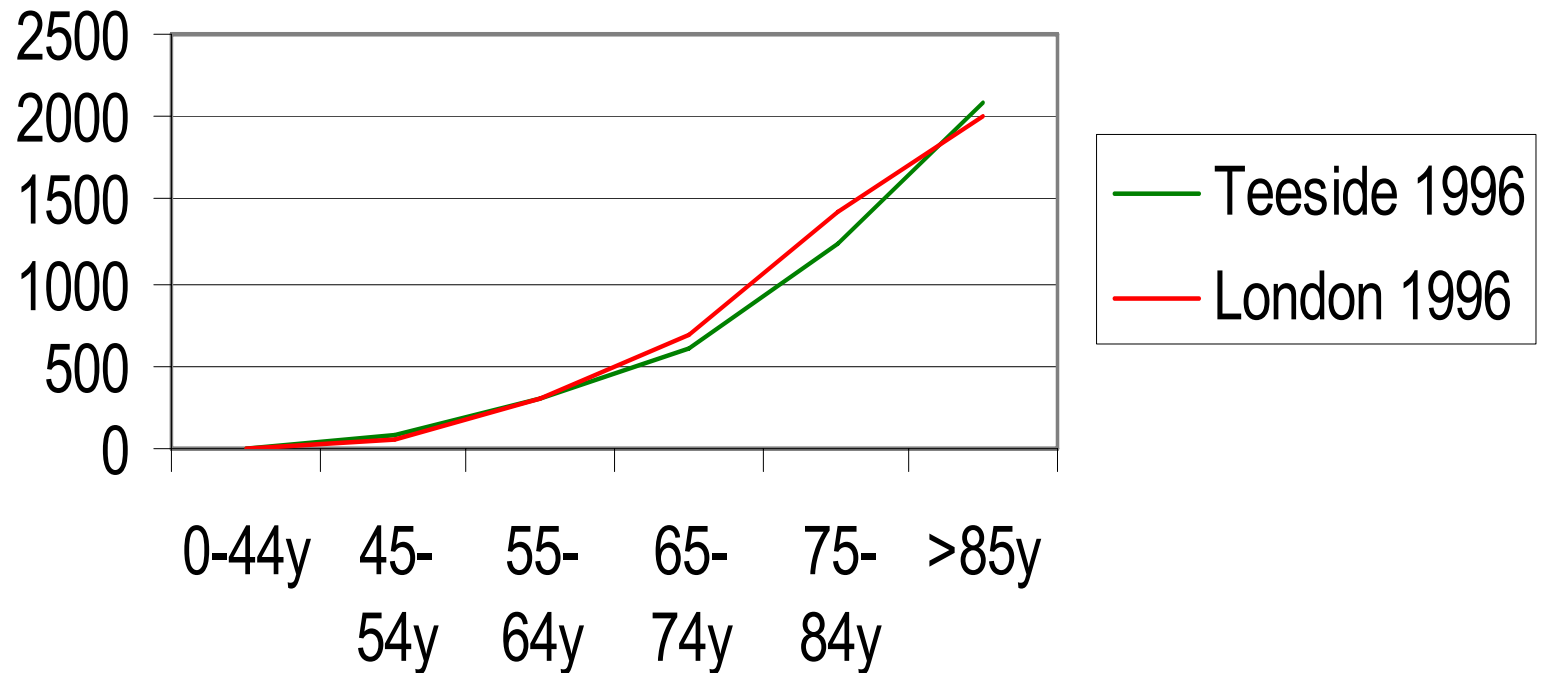
# Stroke course 2007

- Epidemiology
- Anatomy
  - Cerebral circulation
  - Brain functional areas
  - Common areas affected by stroke
- Physiology
  - BP, glucose

# Stroke incidence in UK

- 110 000 people in England & Wales have a first stroke and 30 000 a subsequent stroke per year
- Incidence increases with age
  - 15% stroke patients <45y
  - 66% >60y

## Annual age specific incidence of stroke per 100 000 population



# Stroke outcome in UK

- Stroke is the 3rd commonest cause of death in UK
- 12% mortality rate in first week after stroke, approx 1/3 die in first year
- mortality rates increase with age

7 per 100 000 males 35-44y

290

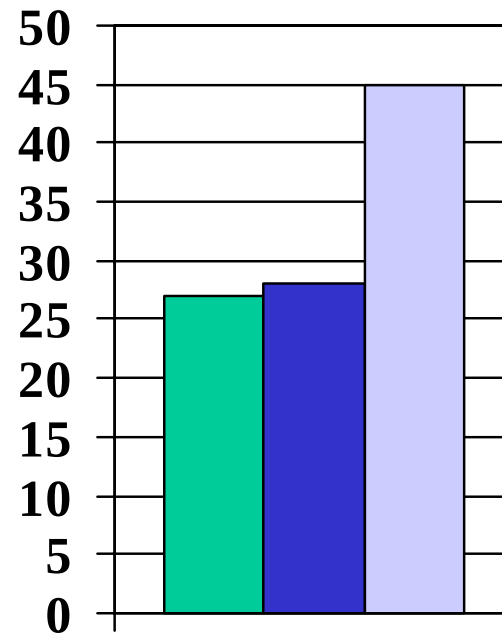
65-74y

1350

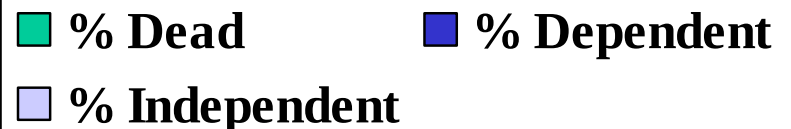
>75y

# Stroke outcome in UK

- Stroke is single biggest cause of major disability in UK



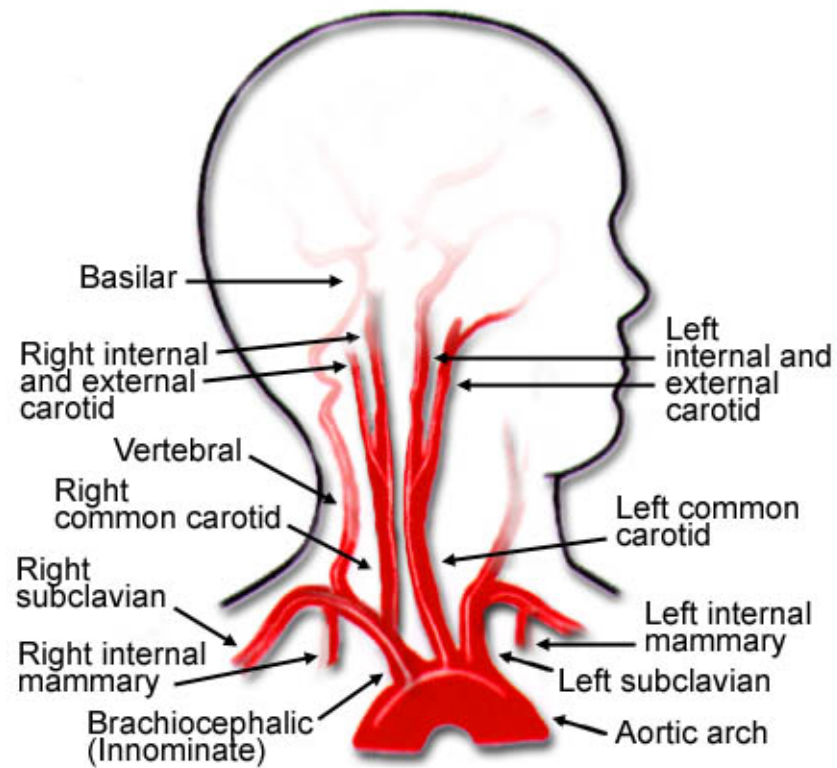
Outcome at 1  
year

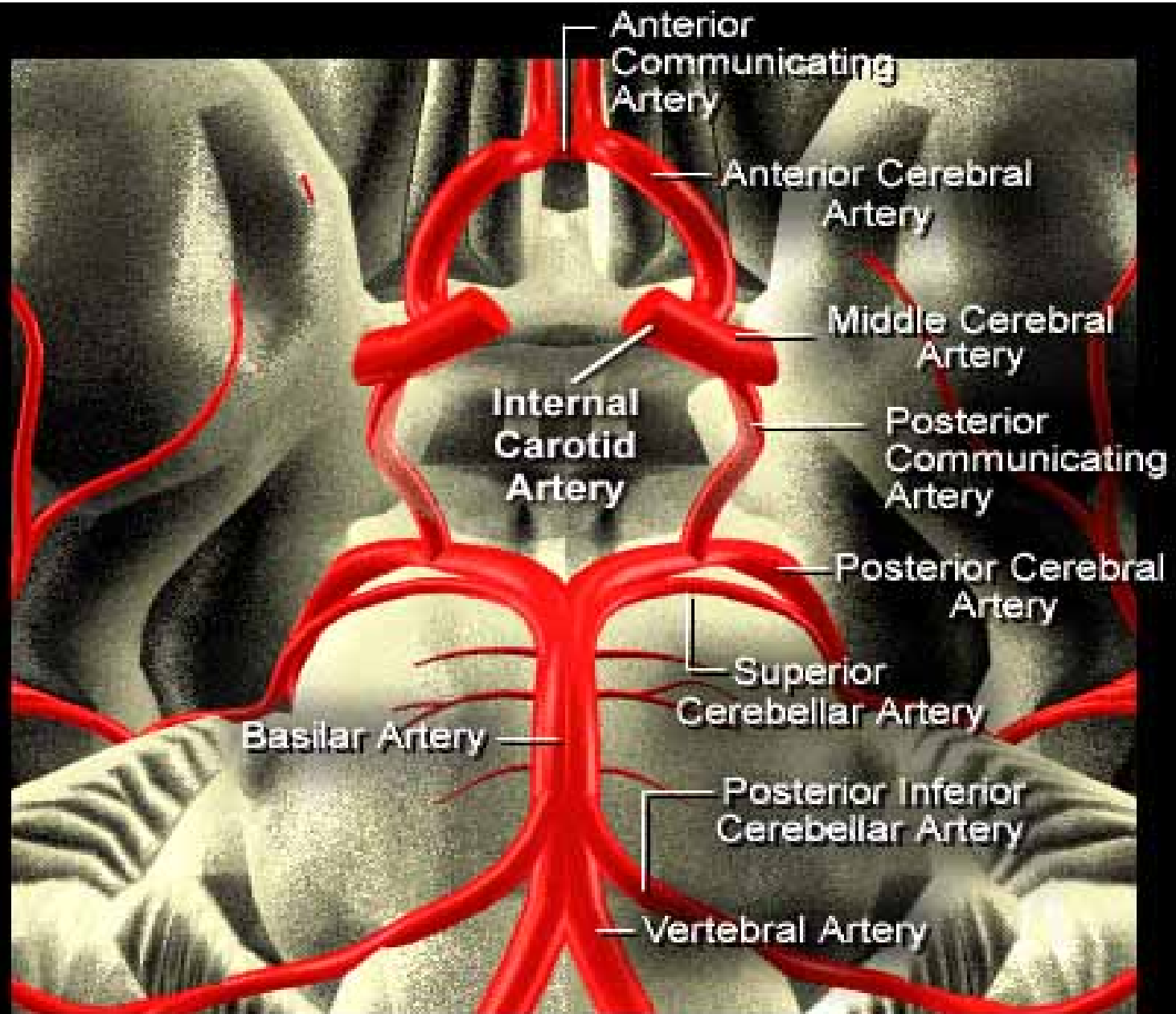


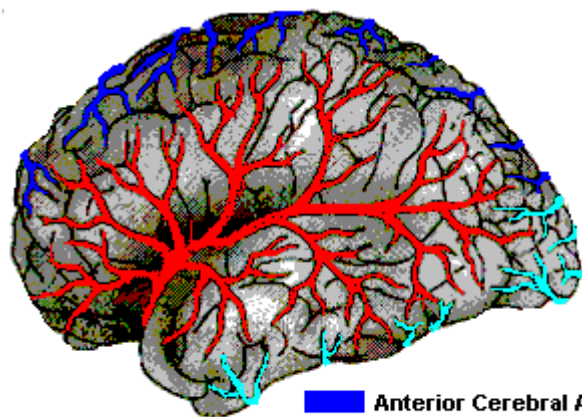
# Cost of stroke in UK

- accounts for 5% NHS expenditure
- £2.5 billion per annum
- 20% all hospital beds occupied by patients with cerebrovascular disease at any one time

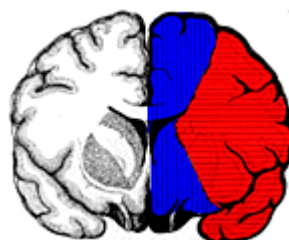
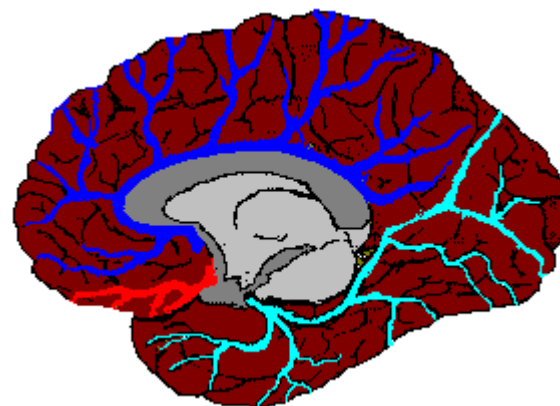
# Anatomy

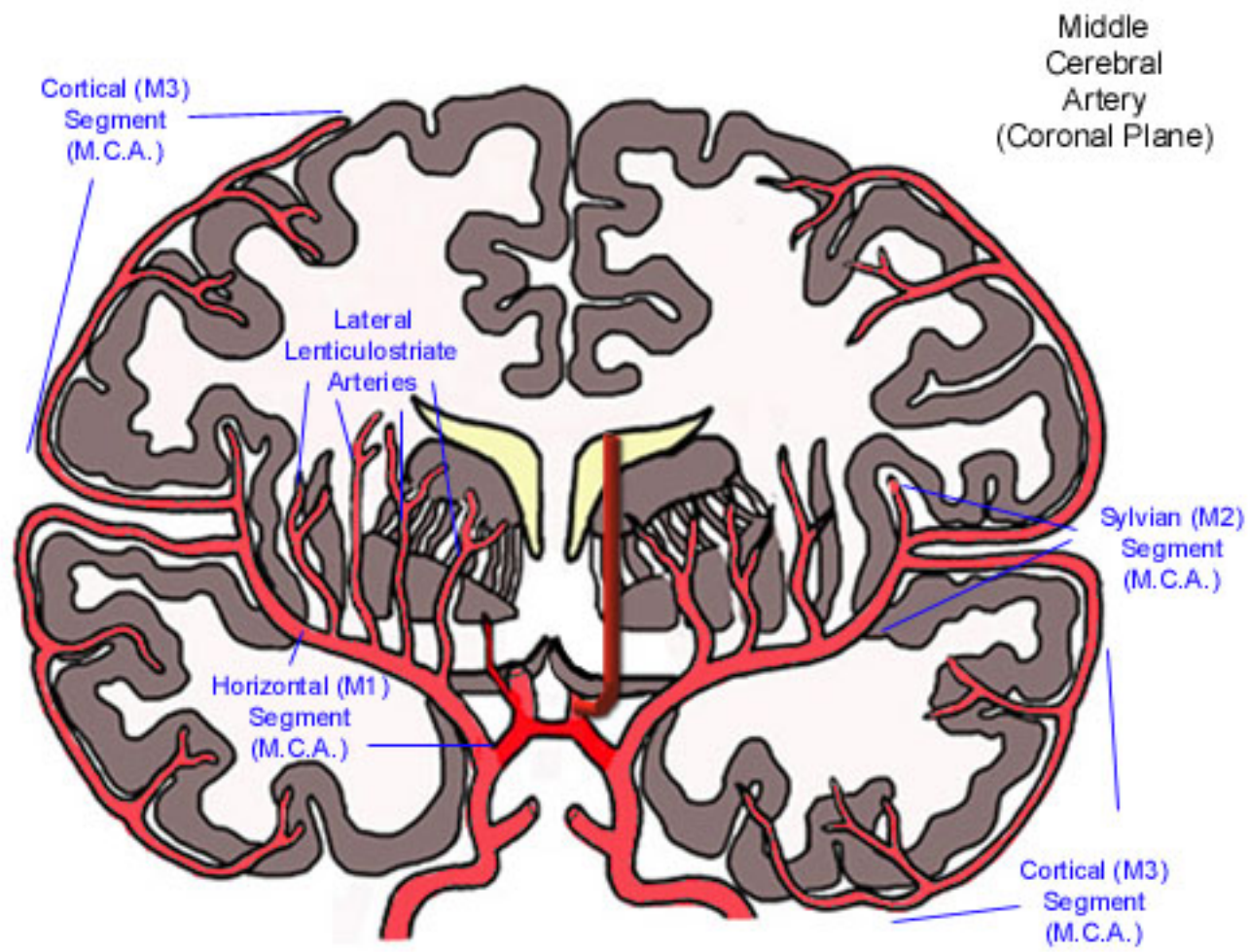


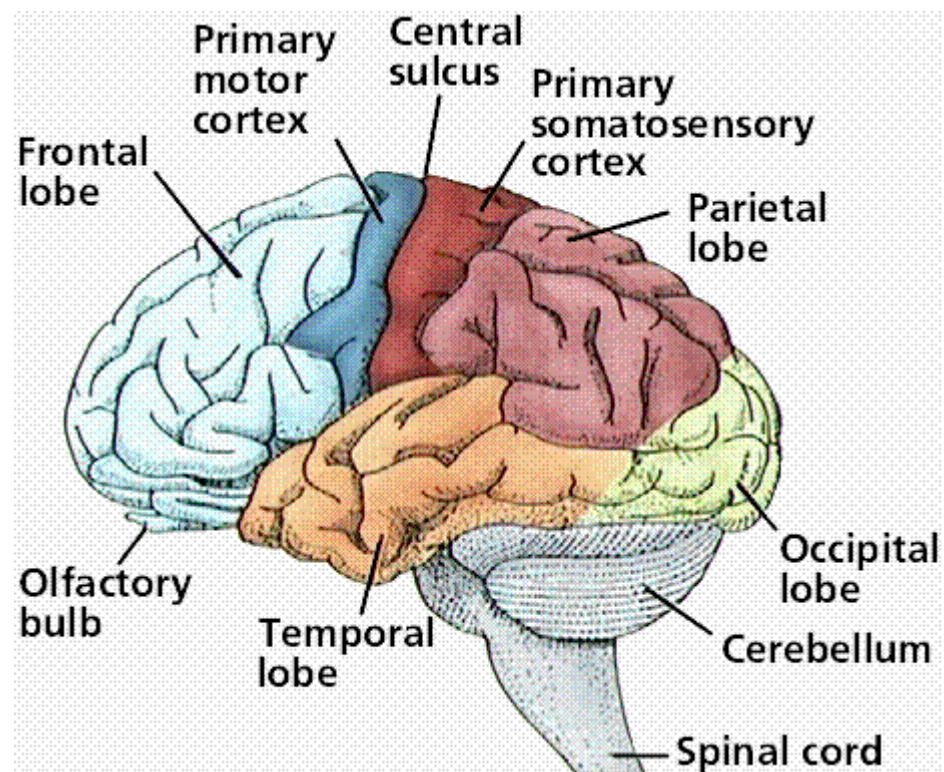




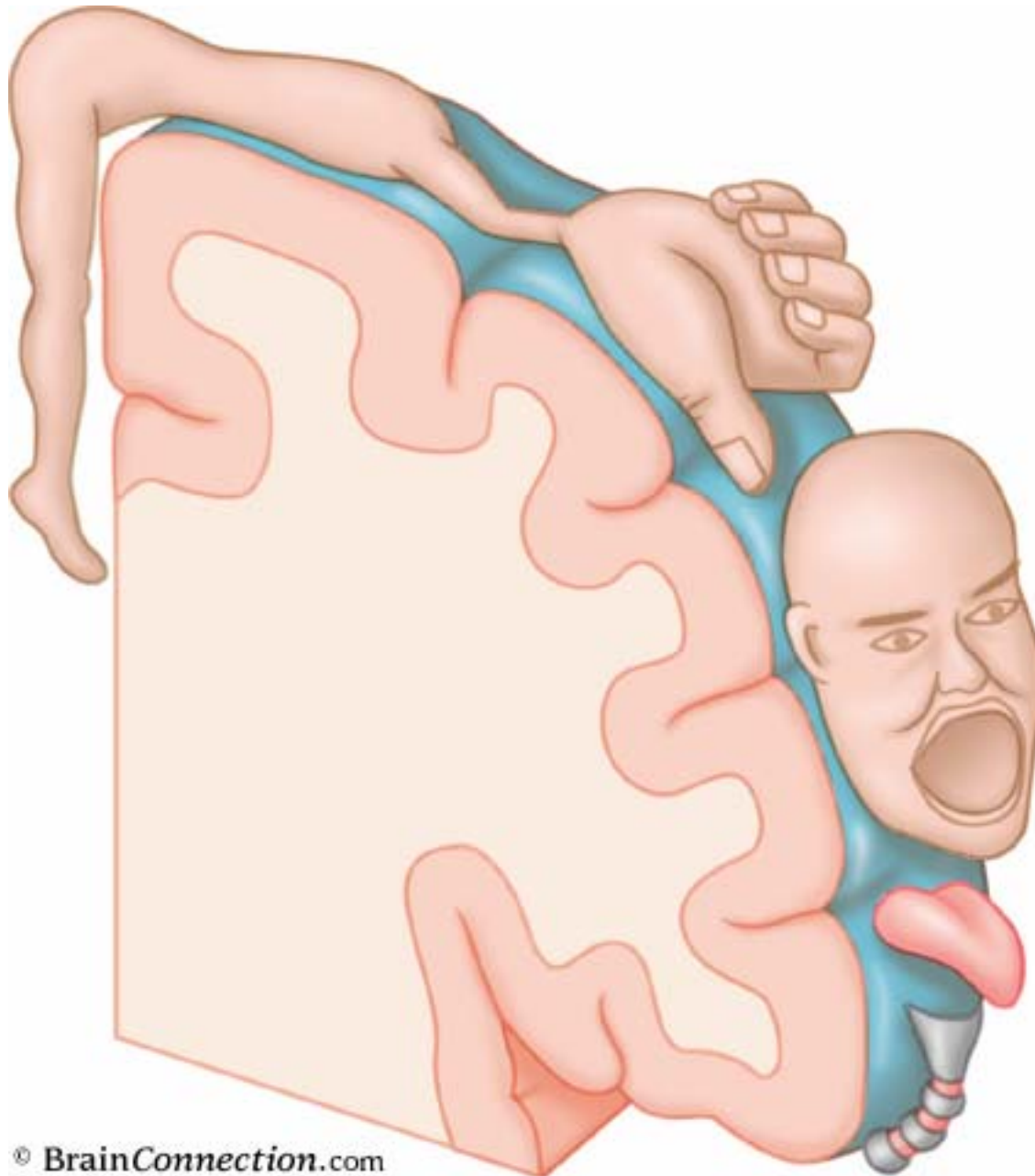
**Anterior Cerebral Artery**  
**Middle Cerebral Artery**  
**Posterior Cerebral Artery**







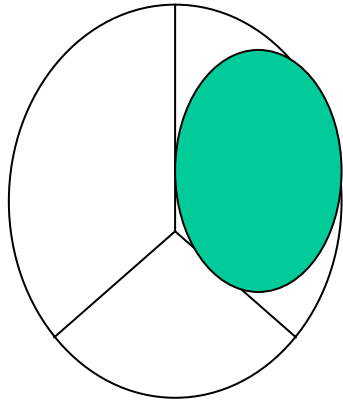
Motor cortex  
homunculus



# Common areas affected

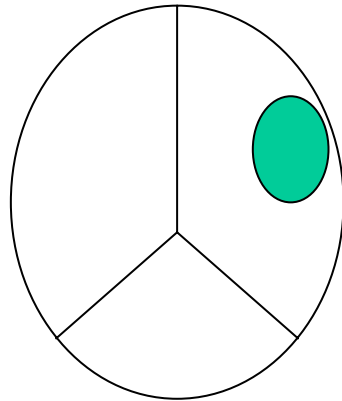
- Middle cerebral artery
  - At its origin
  - More peripheral occlusion
- Lacunar or subcortical
- Posterior cerebral artery
- Bamford classification recommended

# TACS



- Weakness of face/arm/leg
- Speech if L
- Inattention/neglect if R
- Hemianopia

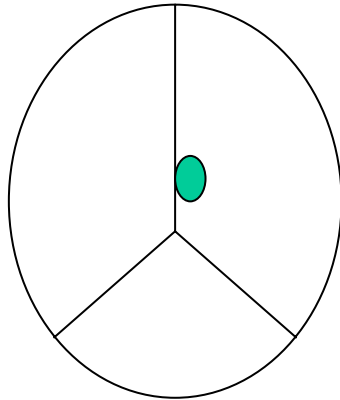
# PACS



- 2 out of 3 of:-
- Weakness of face/arm/leg
- Speech if L or
- Inattention/neglect if R
- Hemianopia

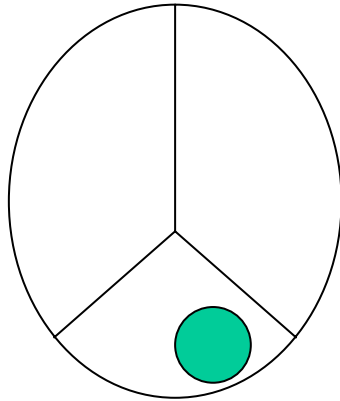
# LACS

- Most commonly hemiparesis only



# POCS

- Vertigo, ataxia, diplopia, isolated hemianopia etc



# Benefits of classification

- Info quick and easy to obtain on most patients
- Syndromes occur frequently to allow pattern recognition
- Good inter observer reliability
- Indication of likely underlying lesion allows sensible planning of investigation
- Correlation with functional outcome and mortality

## 30 day outcome

|             | LACS | TACS       | PACS | POCS |
|-------------|------|------------|------|------|
| Dead        | 2%   | <b>39%</b> | 4%   | 7%   |
| Dependent   | 36%  | <b>56%</b> | 39%  | 31%  |
| Independent | 62%  | <b>4%</b>  | 56%  | 62%  |

## 1 year outcome

|             | LACS | TACS       | PACS | POCS |
|-------------|------|------------|------|------|
| Dead        | 11%  | <b>60%</b> | 16%  | 19%  |
| Dependent   | 28%  | <b>36%</b> | 29%  | 19%  |
| Independent | 60%  | <b>4%</b>  | 55%  | 62%  |

# Causes of 30 day mortality

|                              | LACS | TACS       | PACS | POCS |
|------------------------------|------|------------|------|------|
| Direct neurological sequelae |      | 16%        |      | 11%  |
| Complications of immobility  | 2%   | <b>38%</b> | 9%   | 4%   |
| Cardiac disease              | 4%   | 9%         | 2%   | 2%   |
| Other                        |      | 2%         | 1%   |      |

## PACS

- Risk of early recurrent stroke
- Embolic eg stenosis of internal carotid artery

## POCS

- Early mortality
- Significant recurrence rate
- Often thrombosis in situ rather than embolic

## TACS

- ↓chance of good outcome
- High mortality
- Immobility complications
- Embolic; cardiac/ carotid

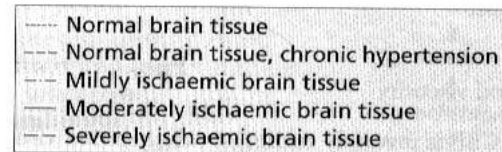
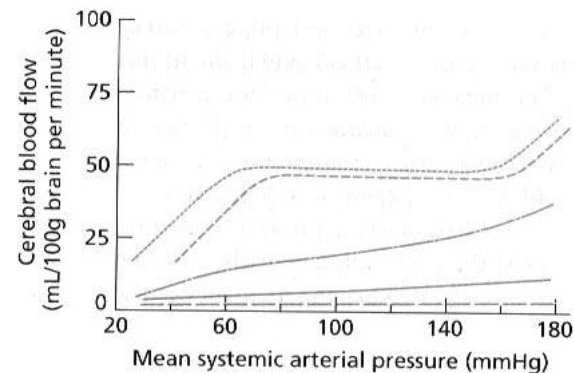
## LACS

- Low mortality
- Large % substantially disabled
- Usually thrombosis in situ

# Physiology

# Cerebral autoregulation

- The ability of cerebral blood flow to remain constant in the face of changes in cerebral perfusion pressure



# Physiology

- Initial event which causes reduction in cerebral blood flow
- Subsequent changes in cellular chemistry caused by ischaemia which lead to cell oedema and death

# Ischaemic penumbra

- Group of cells at periphery of damaged area which may either go on to die or may survive if reperfused before irreversibly damaged

# Rescuing the ischaemic penumbra

- Restoration of blood flow
  - Thrombolysis
- Neuroprotective agents?
- Blood pressure control?
- Tight glucose control?
- Prevention of hypoxia and fever

QUIZ!

1. 60y hypertensive, weak R face, arm, leg, no visual field deficit, speech or visuospatial problems
2. 75y in AF, R hemiparesis, aphasia, R homonymous hemianopia
3. 66y with acute vertigo, headache, nystagmus and past pointing of the right arm and unsteady gait
4. 70y seen 1wk after episode of R arm weakness lasting 5 minutes. Now another episode lasting 24h. Has R face and arm weakness and is dysphasic