

# The Royal College of Physicians Primary Care Concise Guidelines for Stroke 2008

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# Learning Objectives

- To recognise the importance of rapid identification of possible stroke or TIA
- To be familiar with the FAST test and the action required
- To know the initial steps in management of uncomplicated stroke and TIA
- To know about the key recommendations for transfer of care and further rehabilitation after hospital admission.

# Overview

- Source material
- Recognition and diagnosis of acute stroke
- Recognition and management of TIA
- Specialist care and investigation of stroke
- Secondary prevention
- Transfer of care
- Rehabilitation

# Source Material

- Primary Care Concise Guidelines for Stroke 2004
- National Institute for Health and Clinical Excellence Concise Guideline on Acute Stroke and TIA
- RCP Primary Care Concise Guidelines for Stroke 2008
- Concise Guidance: Diagnosis and initial management of transient ischaemic attack (TIA), Clinical Medicine April 2010

# Recognition of Acute Stroke

- Thrombolysis is beneficial for stroke patients if it is given within 3 hours of stroke onset.
- Recognition of stroke:
  - Healthcare professionals
  - Ambulance service and call handlers
  - General public
- Later thrombolysis may do harm - complications

# Thrombolysis

- 12 trials, 3435 patients. 20% dead and 39% dependent
- 6% of 3435 had early symptomatic or fatal intracranial haemorrhages.
- Thrombolytic therapy was associated with an excess of deaths but a reduction in “death or dependency”
- **About 70 extra symptomatic intracranial haemorrhages per 1000 patients (51 per 1000 fatal).**
- **In those randomised within 3 h of stroke:**
- **141 fewer dead or dependent at the end of follow-up per 1000 patients [75–206]**
- 9 more dead per 1000 treated [–39 to 70]; non-significant.

**Suspect a stroke?**

**act**

**FAST**

**call 999**

# *The FAST Test*

- **F**acial weakness
  - Can the person smile? Has their mouth or eye drooped?
- **A**rm weakness
  - Can the person raise both arms?
- **S**peech problems
  - Can the person speak clearly and understand what you say?
- **T**ime to call **999**

<http://www.youtube.com/watch?v=CEmR4HaluYw>

# Suspected acute stroke



- Exclude hypoglycaemia
- Transfer to unit equipped to confirm diagnosis and deliver thrombolysis within 3 hour time window
- Earlier is better!
- Admission to hospital is the rule
- If not admitted and not palliative – should be seen by specialist stroke team at home a.s.a.p.

# Recognition of Stroke in the Emergency Room (ROSIER)

\*If BM  $< 3-5$  mmol/L treat urgently and reassess once blood glucose normal

Has there been loss of consciousness or syncope?    Y (-1)     N (0)

Has there been seizure activity?    Y (-1)     N (0)

Is there a NEW ACUTE onset (or on awakening from sleep)

I.    Asymmetric facial weakness    Y (+1)     N (0)

II.    Asymmetric arm weakness    Y (+1)     N (0)

III.    Asymmetric leg weakness    Y (+1)     N (0)

IV.    Speech disturbance    Y (+1)     N (0)

V.    Visual field defect    Y (+1)     N (0)

\*Total Score \_\_\_\_\_ (-2 to +5)

Provisional diagnosis

Stroke     Non-stroke (specify) \_\_\_\_\_

\*Stroke is unlikely but not completely excluded if total scores are  $\leq 0$ .

# Transient Ischaemic Attack

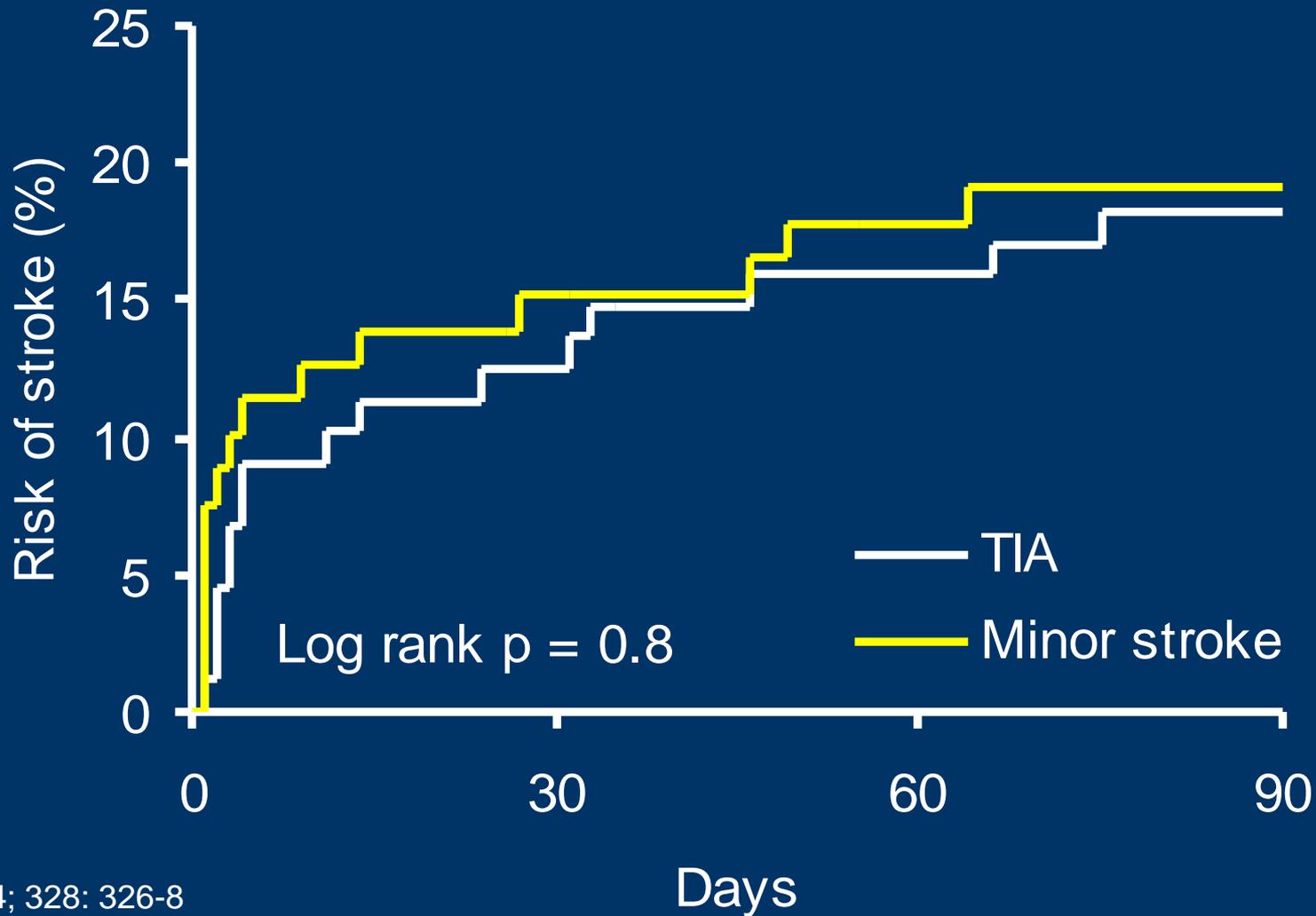
- Retrospective diagnosis!
- **Therefore treat as for stroke.**
- Short-lived acute neurological episodes
  - 50% are not vascular
  - 100% should be treated as if they are.
- If fully resolved at 24 hours, need urgent specialist assessment
- Risk of stroke greatest in first 7-14 days

# Timing of preceding TIA in 870 patients presenting with ischaemic stroke

Time window for prevention is very short

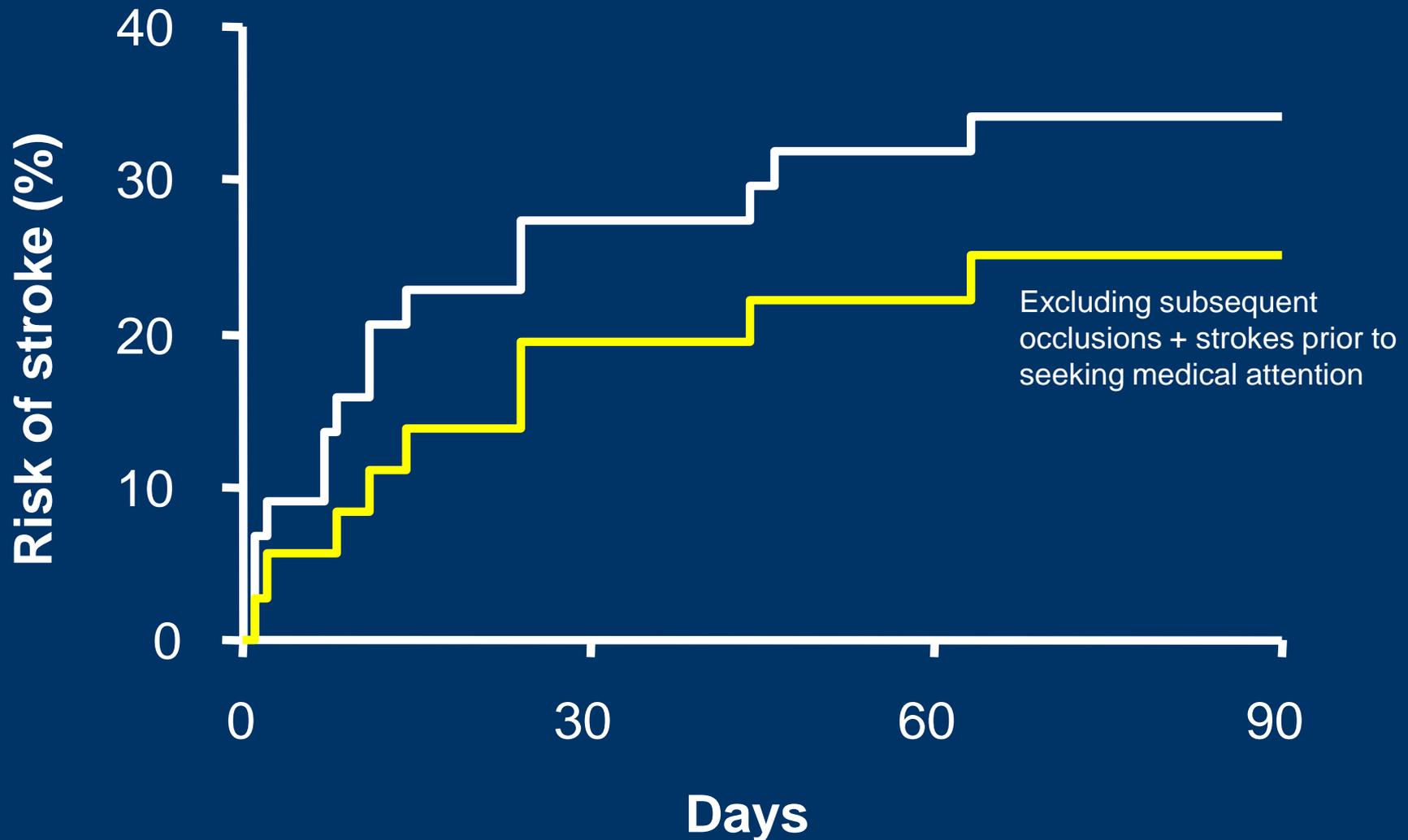


# Cumulative risk of stroke following a TIA or minor stroke in OXVASC



# Risk of stroke after TIA or minor stroke in OXVASC:

Patients with  $\geq 50\%$  symptomatic carotid stenosis



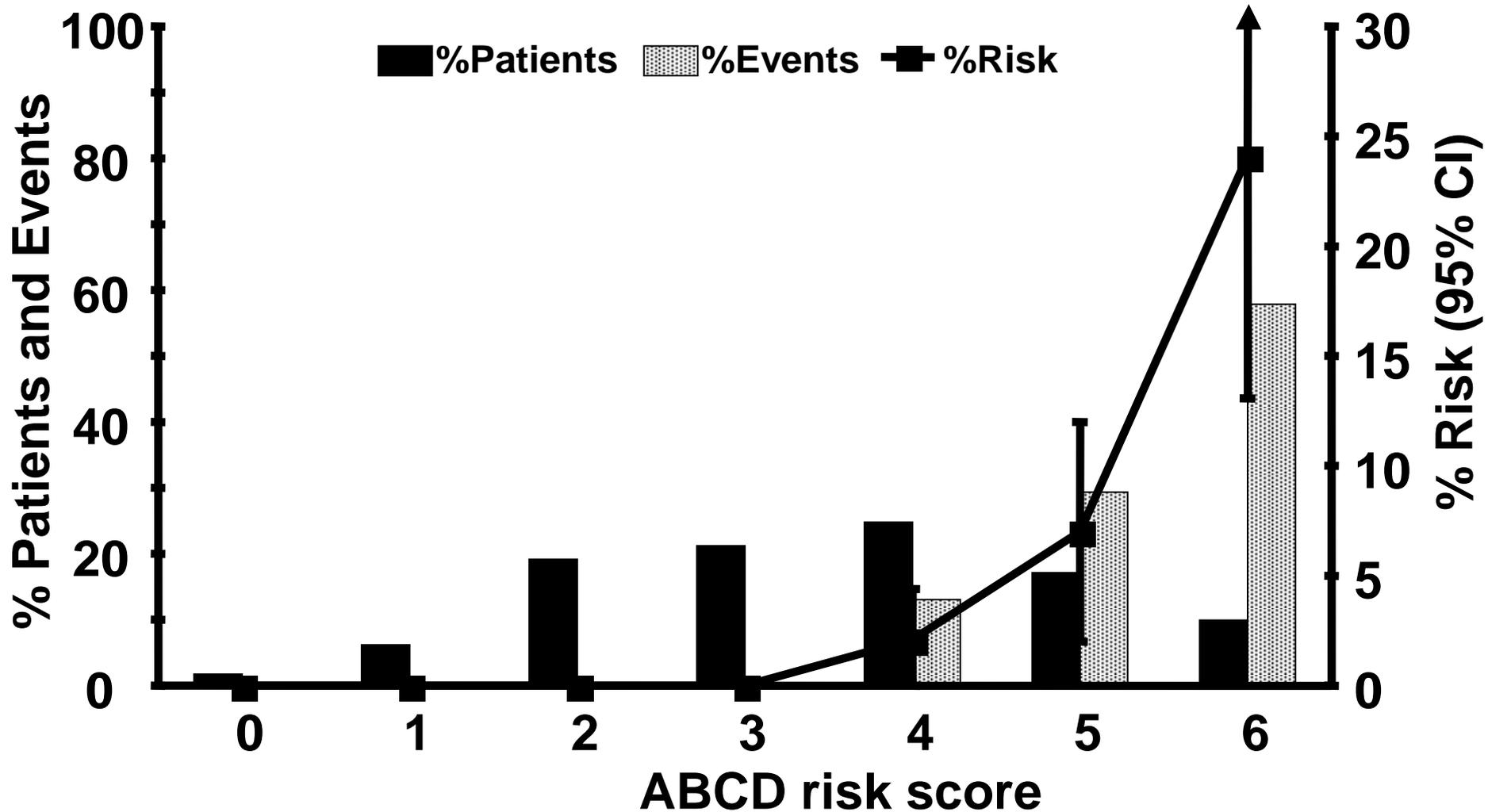
# Independent predictors of 7-day risk of stroke after a TIA (OCSP)

<b>Risk factor</b>	<b>HR (95% CI)</b>	<b>P</b>
Age >60	2.6 (0.8-8.8)	0.01
Elevated BP (140/90)	9.7 (2.2-42)	0.002
Duration <10 mins	1.0	
10-59	3.1 (0.6-14.8)	0.01
60+	6.2 (1.4-26.6)	
Symptoms: Weakness	6.6 (1.5-28.5)	0.01
Speech	2.6 (0.5-13.6)	
Neither	1.0	
Diabetes	4.4 (1.4-14.2)	0.01

# ABCD<sup>2</sup> Score

	<b>Risk factor</b>	<b>Category</b>	<b>Score</b>
<b>A</b>	Age	Age≥60	<b>1</b>
		Age<60	<b>0</b>
<b>B</b>	Blood pressure at assessment	SBP>140 or DBP≥90	<b>1</b>
		Other	<b>0</b>
<b>C</b>	Clinical Features	Unilateral weakness	<b>2</b>
		Speech disturbance (not weak)	<b>1</b>
		Other	<b>0</b>
<b>D</b>	Duration	≥60 minutes	<b>2</b>
		10-59 minutes	<b>1</b>
<b>D</b>	Diabetes	Yes	<b>1</b>
<b>Possible total</b>			<hr/> <b>7</b>

All OXVASC & hospital clinic referrals pooled:  
7 day stroke risk by ABCD score (excluding  
strokes prior to seeking medical attention)



# ABCD<sup>2</sup> Score

- **Score 4 or more:**
  - Aspirin 300mg daily
  - Specialist assessment within 24 hours
  - Admission to a stroke unit
  - Secondary prevention a.s.a.p.
- **2+ TIAs in a week:**
  - As above even if score 3 or less
- **Score 3 or less:**
  - Specialist assessment a.s.a.p. – within one week.

# Acute management of TIA

- Confirm that there is no residual neurological deficit (exclude stroke)
- Check:
  - Bloods: glucose, fasting lipids, renal function, platelets
  - ECG - exclude atrial fibrillation
- Start Aspirin (unless contra-indicated)
- Decide whether the TIA is 'high' or 'low risk'
  - Do they need the specialist assessment this week or within 24 hours?
  - Get the patient to the specialist at the appropriate time.

# Specialist care for acute stroke

- Perform brain imaging immediately if any of these apply:
  - on anticoagulant treatment
  - a known bleeding tendency
  - a depressed level of consciousness
  - unexplained progressive or fluctuating symptoms
  - papilloedema, neck stiffness or fever
  - severe headache at onset of stroke symptoms
- Otherwise brain imaging should be performed as soon as possible

**Diffusion-weighted MRI** is the imaging modality of choice for patients with suspected TIA who require brain imaging and should be performed:

- **Within 24 hours** of onset of symptoms, if the risk of subsequent stroke is **high** (ABCD2 score  $\geq 4$  or with crescendo TIA)
- **Within 1 week of onset** of symptoms, if the risk of subsequent stroke is **lower** (ABCD2 score  $\leq 3$ ).

***Diagnostic yield is high within first 24 hours following TIA , but falls rapidly with time.***

# Further investigations

- Significant carotid artery stenosis
  - Ipsilateral disease
  - Decreased benefit with time
- Structural cardiac disease
  - Especially patent foramen ovale
- Atrial fibrillation
  - Established or paroxysmal?
  - Need for 24-hour cardiac monitoring

# Carotid Doppler ultrasound

## Duplex Examination of the Carotid Arteries

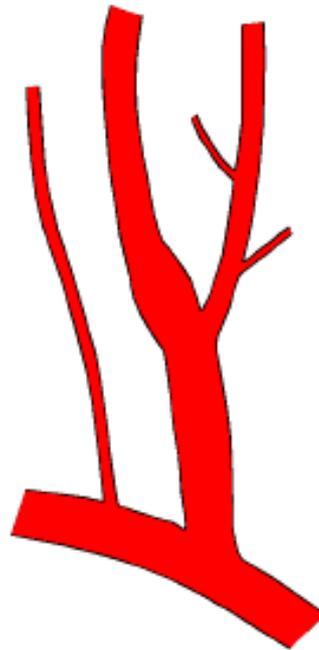
**RIGHT**

**Internal:** Patent no significant stenosis

**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** Patent antegrade flow



**LEFT**

**Internal:** Patent no significant stenosis

**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** Patent antegrade flow detected



# Carotid Doppler ultrasound

## Duplex Examination of the Carotid Arteries

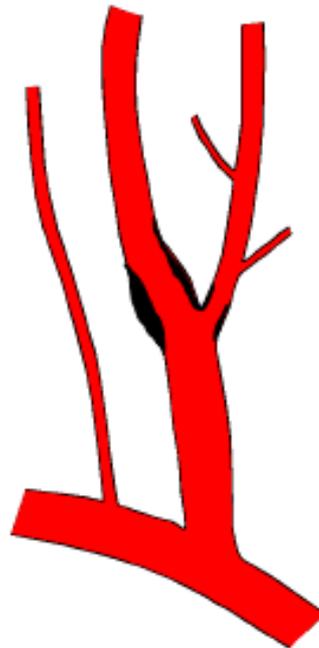
### RIGHT

**Internal:** Mild amount of atheroma, no significant stenosis – waveform suggests distal occlusion

**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** Patent with antegrade flow detected



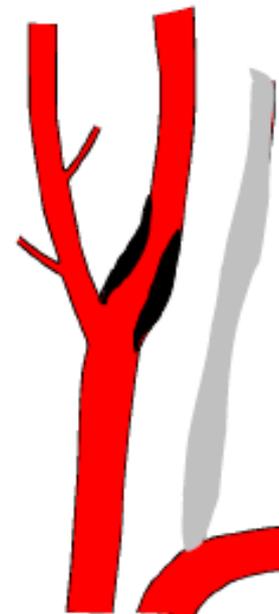
### LEFT

**Internal:** 60% stenosis

**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** Not imaged



# Carotid Doppler ultrasound

## Duplex Examination of the Carotid Arteries

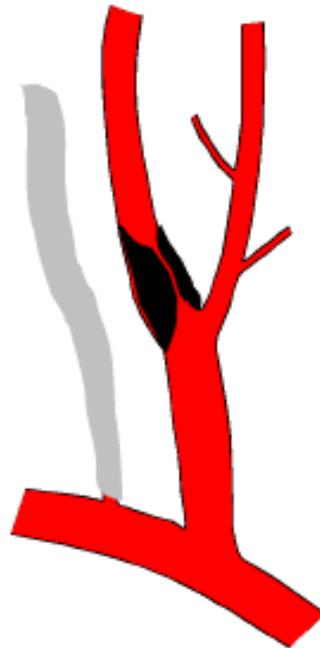
### RIGHT

**Internal:** Near occlusion >90% stenosis

**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** not imaged



### LEFT

**Internal:** >70% stenosis

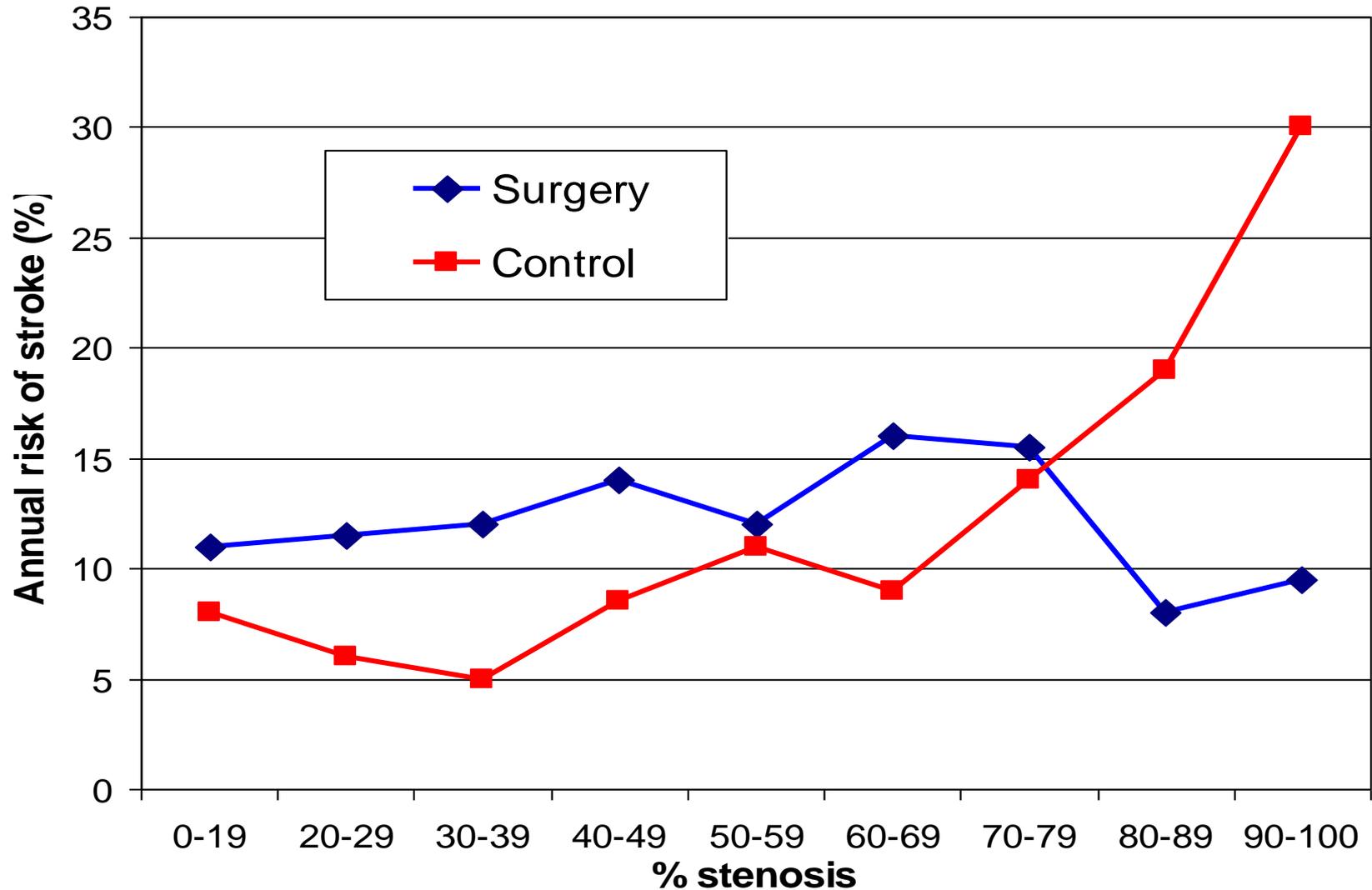
**External:** Patent no significant stenosis

**Common:** Patent no significant stenosis

**Vertebral:** not imaged

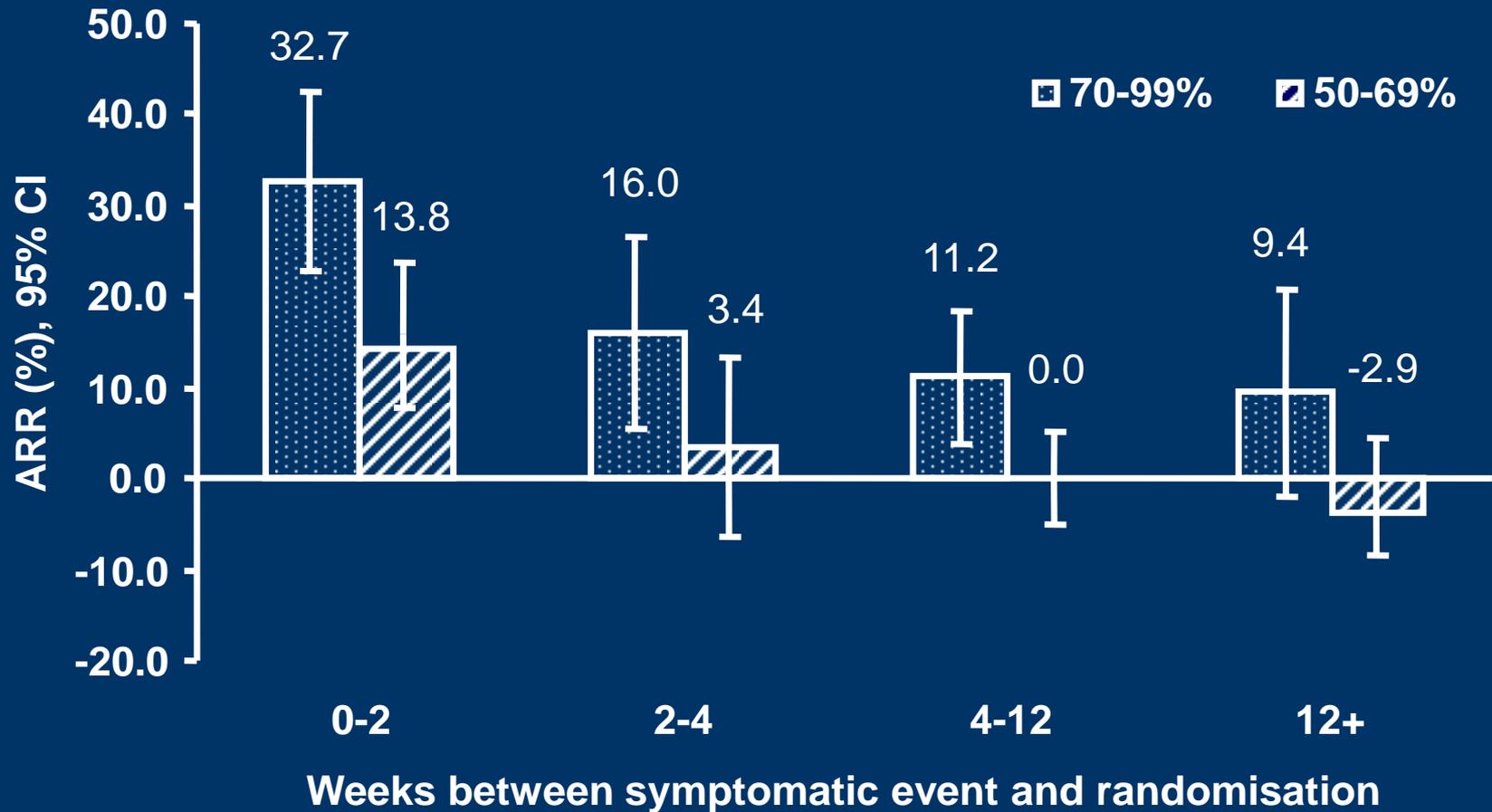


# Benefit of endarterectomy

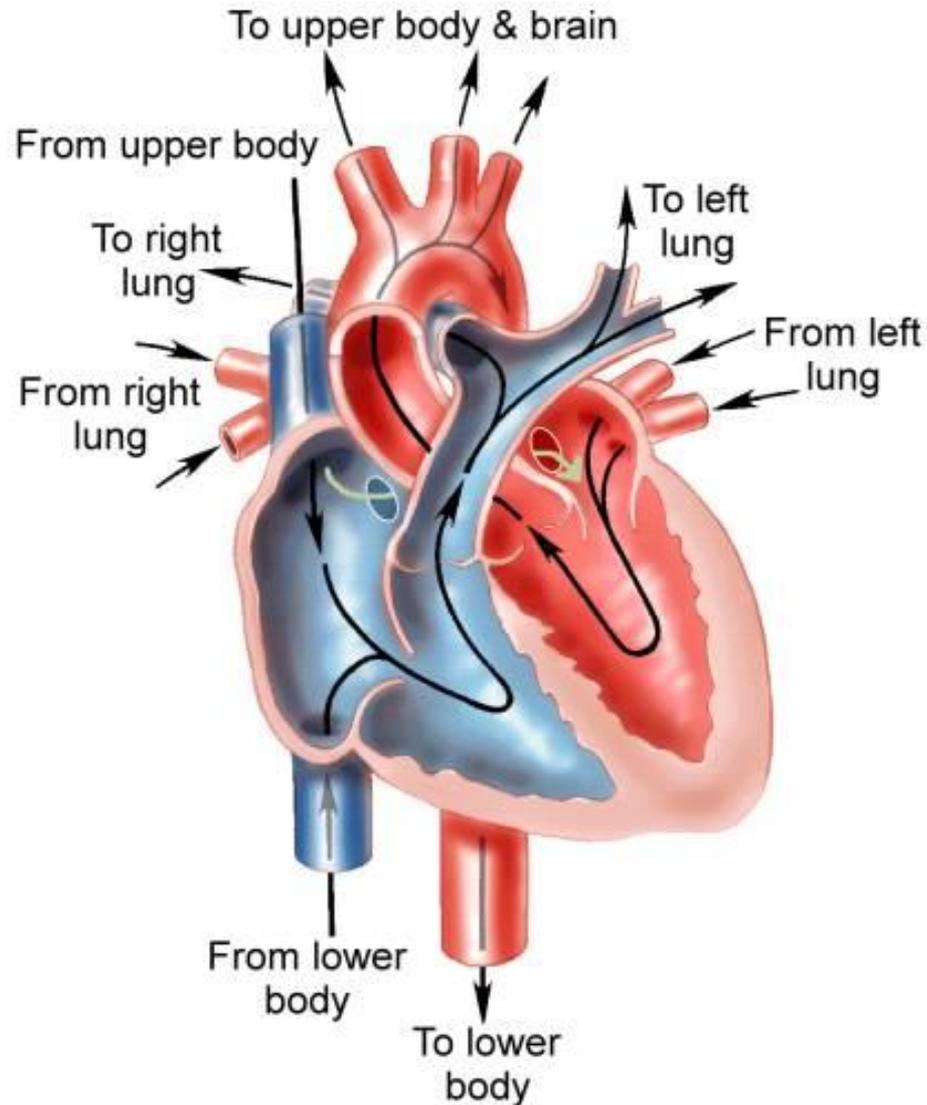


# Effect of carotid endarterectomy stratified by time from last event to randomisation

Ipsilateral ischaemic stroke and operative stroke or death



# Patent Foramen Ovale



# Patent Foramen Ovale

- 146 patients with acute ischaemic stroke
- 31% cryptogenic; 69% identifiable cause
- Higher incidence in cryptogenic stroke:
  - < 55 years; **48%** compared with 4%; ( $P < 0.001$ )
  - $\geq 55$  years; **38%** compared with 8%; ( $P < 0.001$ )
- Stroke 33.3 times more likely if both atrial septal aneurysm and patent foramen ovale compared with neither.

# Secondary Prevention

- Risk of further stroke:
  - 10% in first week
  - 20% in first month
  - 30-43% over next five years.
- GPs should maintain a stroke register
  - Audit primary and secondary prevention
- Individual comprehensive prevention strategy for each patient.
- Risk factors monitored at least yearly.

# Secondary Prevention

- Information about stroke risk factors:
  - Given in hospital
  - Reinforced at every opportunity
  - Provided in an appropriate format
- Information about medication
  - Verbal and written
  - In an appropriate format
  - Appropriate compliance aids
- Regular re-supply and review of medication

# Transfer of Care

- Patients and families fully prepared and involved in planning discharge
- GPs, 1<sup>0</sup> healthcare teams and Social Services informed before or at the time of discharge
- All equipment and support in place
- Any continuing treatment provided by appropriate specialist service
- Patients and families informed about contacts

# Transfer of Care

- Adequate supplies of medication
- GP given comprehensive list of medication
- Patient's ability to take responsibility for medication adequately assessed
- If patient unable, family and carers aware of reasons for each medication.

# Lifestyle Recommendations

- Smoking (not!)
- Regular exercise (20-30 minutes a day)
- Diet (fruit and oily fish)
- Unsaturated fats
- Reduce salt intake
- Weight loss if overweight
- Alcohol within safe limits.

# Management of Hypertension

- Optimal target = 130/80
- Bilateral carotid stenosis >70% - SBP = 150
- Aged 55+ or black – CCB or thiazide
- <55 – ACE inhibitor or ARB
- Add alternative agent(s) later
- Avoid  $\beta$ -blockers as first or second line unless given for other specific indications.

# Anti-thrombotic agents

- Aspirin 75mg + Dipyridamole MR 200mg bd
- Dipyridamole may not be tolerated
- Clopidogrel 75mg if aspirin intolerant
- PPI if dyspepsia or bleeding risk
- “More intensive” treatment not justified
- Anticoagulation
  - In all patients with sustained or paroxysmal AF
  - **Must** exclude intracranial haemorrhage.

# Lipid Management

- Treatment with a Statin for all if:
  - Total Cholesterol  $>3.5$  mmol/l
  - LDL cholesterol  $>2.5$  mmol/l
- Treatment goals:
  - Total cholesterol  $<4.0$  mmol/l
  - LDL cholesterol  $<2.0$  mmol/l, **OR**
- 25% reduction in total **and** 30% reduction in LDL
- Avoid statins in patients with PICH +/- H-T

# Rehabilitation

- Goal-oriented
- Where goal not achieved. either:
  - Adjust the goal
  - Adjust the intervention
  - No further intervention towards that goal
- If residual impairment:
  - Review after six months
  - Further rehabilitation if:
    - New problems
    - Change in physical state or social environment

# Rehabilitation - physical

- Mobility
- Spatial awareness
- Apraxia
- Dysphasia
- Dysarthria
- Visual impairment
- Dysphagia

# Rehabilitation - mood

- Depression
- Anxiety
- Emotionalism
- Cognitive impairment
- Attention and concentration
- Memory

# Long-term care

- Neuropathic pain
- Oral health
- Nutrition
- Practical and emotional support
- Social participation
- Driving
- Vocational activities
- Sexual dysfunction.

# Final word!!

**Suspect a stroke?  
Act FAST. Call 999.**

**F** **Facial weakness**  
Can the person smile? Has their mouth or eye drooped?

**A** **Arm weakness**  
Can the person raise both arms?

**S** **Speech problems**  
Can the person speak clearly and understand what you say?

**T** **Test all three symptoms**

Stroke is a medical emergency.  
By calling 999 early treatment can be given which can prevent further brain damage.

Stroke helpline 0845 3033 100 [www.stroke.org.uk](http://www.stroke.org.uk)

Registered Charity No. 21991



- Use the FAST tool to screen for stroke or TIA outside hospital

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# References

- CG68 NICE Guideline: STROKE: National Clinical Guideline for diagnosis and initial management of acute stroke and transient ischaemic attack (TIA).  
[www.nice.org.uk/CG68](http://www.nice.org.uk/CG68)
- Giles MF, Rothwell PM. Risk of stroke early after transient ischaemic attack: a systematic review and meta analysis. Lancet neurology 2007; 6 (12): 1063-1072
- Rothwell PM et al. Effect of urgent treatment of TIA and minor stroke on early recurrent stroke (EXPRESS study) a prospective population-based sequential comparison. Lancet 2007 1342-42
- Lavalley P et al. A transient ischaemic attack clinic with round-the-clock access (SOS-TIA): feasibility and effects. Lancet 2007

# References

- Harbison J, Hossain O, Jenkinson D et al. Diagnostic accuracy of stroke referrals from primary care, emergency room physicians, and ambulance staff using the face arm speech test. *Stroke* 2003; 34(1): 71–76.
- Johnston SC, Rothwell PM, Nguyen-Huynh MN et al. Validation and refinement of scores to predict very early stroke risk after transient ischaemic attack. *Lancet* 2007; 369(9558): 283–292.
- Nor AM, Davis J, Sen B et al. The Recognition of Stroke in the Emergency Room (ROSIER) scale: development and validation of a stroke recognition instrument. *Lancet Neurology* 2005;4(11):727–734.

# Summary of 2010 Guideline

<b>A:</b>	<b><u>Prompt recognition of symptoms and correct diagnosis of TIA.</u></b> Patients with transient neurological dysfunction often fail to recognise the significance of their symptoms and delay seeking medical attention. The transient nature of TIA symptoms does not reduce the importance of an immediate response.
1.	<b>In people with sudden onset of neurological symptoms:</b> <ul style="list-style-type: none"><li>• A validated tool such as the 'FAST' (see Box 1) should be used outside hospital to screen for a diagnosis of a stroke or TIA</li><li>• Hypoglycaemia should be excluded as the cause of these symptoms.</li></ul>
2.	<b>In people who are admitted to Accident and Emergency (A&amp;E) with a suspected stroke or TIA :</b> <ul style="list-style-type: none"><li>• The diagnosis should be established rapidly using a validated tools such as the ROSIER (see Figure 1)</li></ul>

<b>B:</b>	<p><b>Assessment and early management of TIA</b>  <b>TIA is an important predictor of subsequent stroke.</b>  All patients who have had a suspected TIA should be assessed as soon as possible for their risk of subsequent stroke.</p>
<b>1.</b>	<p><b>A validated scoring system, such as ABCD<sup>2</sup> (see Box 2), should be used to assess the risk of stroke following a suspected TIA:</b>  <b>An ABCD<sup>2</sup> score of:</b></p> <ul style="list-style-type: none"> <li>○ <b>4 or above</b> represents a <b>high risk</b> of subsequent stroke</li> <li>○ <b>3 or below</b> represents a <b>lower risk</b> of subsequent stroke</li> </ul> <p>People with <b>crescendo TIA</b> (<math>\geq 2</math> TIAs in a week) should be treated as being at <b>high risk</b> of stroke, even if their ABCD<sup>2</sup> score is <math>\leq 3</math>.  People who have had a TIA, but who <b>present late</b> (more than 1 week after their last symptom has resolved), should be treated as though they are at <b>lower risk</b> of stroke.</p>
<b>2.</b>	<p><b>All patients with suspected TIA should have:</b></p> <ul style="list-style-type: none"> <li>○ <b>Aspirin 300mg</b> daily started immediately.</li> <li>○ <b>Specialist assessment</b> and investigation: <ul style="list-style-type: none"> <li>○ <b>Within 24 hours</b> for patients at <b>high risk</b> of subsequent stroke</li> <li>○ As soon as possible, but definitely <b>within 1 week</b> for patients at <b>lower risk</b> of subsequent stroke</li> </ul> </li> <li>○ Measures for <b>secondary prevention</b> introduced as soon as the diagnosis is confirmed, including discussion of individual risk factors.</li> </ul>

<p><b>C:</b></p>	<p><b><u>Brain imaging following TIA</u></b></p> <p><b>Background:</b></p> <p><b>Not all patients with TIA need immediate brain imaging.</b></p> <p>Patients require specialist assessment before a decision on imaging is made.</p> <p>Brain imaging following suspected TIA is recommended when:</p> <ul style="list-style-type: none"> <li>○ The vascular territory affected is uncertain (anterior or posterior circulation) and the patient is being considered for carotid endarterectomy</li> <li>○ The pathology underlying the patient's neurological symptoms is uncertain – e.g. alternative diagnoses may include migraine, epilepsy, tumour</li> <li>○ Intra-cerebral haemorrhage needs to be excluded - e.g. patients on anticoagulants, long duration of symptoms.</li> </ul>
<p><b>1.</b></p>	<p>People who have had a suspected TIA should be <b>assessed by a specialist</b> before a decision on brain imaging is made.</p>
<p><b>2.</b></p>	<p><b>Diffusion-weighted MRI is the imaging modality of choice for patients with suspected TIA who require brain imaging and should be performed:</b></p> <ul style="list-style-type: none"> <li>○ <b>Within 24 hours</b> of onset of symptoms, if the risk of subsequent stroke is <b>high</b> (ABCD<sup>2</sup> score <math>\geq 4</math> or with crescendo TIA)</li> <li>○ <b>Within 1 week of onset</b> of symptoms, if the risk of subsequent stroke is <b>lower</b> (ABCD<sup>2</sup> score <math>\leq 3</math>).</li> </ul> <p><b><i>Diagnostic yield is high within first 24 hours following TIA , but falls rapidly with time.</i></b></p>
<p><b>3.</b></p>	<p><b>If MRI is contraindicated, CT scanning should be used:</b></p> <ul style="list-style-type: none"> <li>○ Patients with pacemakers, aneurysm clips, metallic valves etc.</li> </ul> <p><b><i>Diagnostic yield from brain CT is low in TIA, compared with diffusion-weighted MRI.</i></b></p>

<b>D:</b>	<b><u>Carotid artery imaging and intervention</u></b>
	<p><b>Background information:</b>  <b>Carotid imaging is essential to identify patients who will benefit from carotid endarterectomy (CEA):</b></p> <ul style="list-style-type: none"> <li>○ All patients suitable for CEA require carotid imaging <b>within 1 week</b> of onset of symptoms.</li> <li>○ Doppler Ultrasound, CT angiography or MR angiography can all be used in the screening for and assessment of carotid stenosis, depending on local availability and in accordance with advice from the respective radiology / vascular surgery teams</li> </ul>
<b>1.</b>	<p><b>If significant carotid stenosis* is present in the symptomatic artery, and neurological symptoms are stable the patient should:</b></p> <ul style="list-style-type: none"> <li>○ Be assessed and referred for CEA within <b>1 week</b> of onset of TIA symptoms</li> <li>○ Undergo surgery within a maximum of <b>2 weeks</b> of onset of TIA symptoms</li> <li>○ Receive <b>best medical treatment</b> with anti-platelet agents, cholesterol lowering agents, control of blood pressure and lifestyle advice.</li> </ul> <p>* Significant carotid stenosis is defined as 70-99% using ECST, or &gt;50-99% using NASCET methods  ECST - European Carotid Surgery Trialists' Collaborative Group  NASCET - North American Symptomatic Carotid Endarterectomy Trial</p>
<b>2.</b>	<p><b>If significant carotid stenosis is not present according to the above criteria, the patient should:</b></p> <ul style="list-style-type: none"> <li>○ Not undergo surgery, but receive <b>best medical treatment</b> as outlined in 2 above.</li> </ul>