Box 1

Definitions of transient ischaemic attack based on symptoms and duration

- The WHO defines transient ischaemic attack (TIA) based on duration only[15]
- ICD-11[16] and the American Heart Association[8] define TIA based on both duration and evidence of 'no infarction' clinically and on imaging
- The National Institute of Neurological Disorders and Stroke criteria,[17] which are widely used, define TIA based on clinical symptoms (which vary according to vascular territory involved, see table 1, below) and duration (defined as episodes of neurological dysfunction commonly lasting from 2 to 15 minutes but occasionally lasting as long as a day) with the absence of symptoms suggestive of an alternative diagnosis, see table 2, below[17]

Box 2

Definitions of stroke

WHO
In 1978, the WHO defined stroke as a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting > 24 hours or leading to death with no apparent cause other than of vascular origin[15]

ICD-11
Recently, ICD-11 classified the term 'stroke' into four categories:[15]
Cerebral ischaemic stroke: Acute focal neurological dysfunction caused by focal infarction at single or multiple sites of the brain or retina. The evidence of this acute infarction may come either from symptom duration > 24 hours or neuroimaging/other techniques in the clinically relevant area
Intracerebral haemorrhage: Acute neurological dysfunction caused by haemorrhage within the brain parenchyma or in the ventricular system. This includes non-traumatic haemorrhage only
Subarachnoid haemorrhage: Acute neurological dysfunction caused by subarachnoid haemorrhage
Stroke not known if ischaemic or haemorrhagic: Acute focal neurological dysfunction lasting > 24 hours (or leads to death in < 24 hours), but subtype of stroke (ischaemic or haemorrhagic) has not been determined by neuroimaging or other techniques

Table 1

Clinical symptoms of transient ischaemic attack based on vascular territory

Carotid	Vertebrobasilar
Dysarthria, weakness, paralysis, clumsiness of one or more extremity and or face	Weakness, paralysis, or clumsiness of any combination of upper and lower extremities and face, left and/or right
Loss of vision in one eye or, rarely, one field of vision (homonymous hemianopsia)	Loss of vision in one or both homonymous visual fields
Numbness or paraesthesia involving the left or right upper and/or lower extremity and/or face	Loss of feeling, numbness, or paraesthesia involving the left, right, or both sides
Aphasia	Loss of balance, vertigo, unsteadiness or disequilibrium, diplopia, dysphagia, or dysarthria are characteristic and often occur with other neurological deficits

impairment and recall bias make diagnosis of TIA and stroke challenging. Certain clinical features, listed in table 2, below, make a diagnosis of TIA/stroke less probable. Knowing the exact time of onset, the presence of definite focal symptoms and neurological signs, being able to lateralise signs to the left or right side of the brain and being able to determine a clinical stroke sub-classification increases the probability that the event is a stroke.[18]

All patients with suspected TIA should be assessed by a stroke specialist before a decision on brain imaging is made.[19] For those with clinically definite TIAs, the use of diffusion weighted imaging (DWI) MRI is debatable. Between 15 and 30% of patients with a clinically definite TIA have a DWI-positive lesion (i.e. an acute ischaemic lesion) on MRI. The five-year risk for these patients is 10-15% and for DWI-negative patients 5-10%. MRI scanning of all TIAs is difficult to achieve and unlikely to be cost effective.[8,20]

For those cases where there is diagnostic uncertainty, imaging (either CT or MRI) may be helpful. This is done largely to exclude an alternative diagnosis (e.g. a space occupying lesion). Where imaging cannot be undertaken within seven days of symptoms, MRI with appropriate blood sensitive sequences is the preferred means of excluding haemorrhage.[19]

The utility of other CT modalities (CT angiogram, CT perfusion) has not been studied extensively in patients with TIAs. Systematic reports of a multimodal

Table 2

Clinical symptoms which suggest lower probability of a stroke/TIA

- Unconsciousness without vertebrobasilar symptoms
- Tonic and/or clonic activity
- Prolonged march of symptoms over several areas of the body
- Scintillating scotoma
- March of a sensory deficit
- Vertigo, dizziness or wooziness alone
- Dysphagia alone
- Dysarthria alone
- Diplopia alone
- Incontinence of bowel or bladder
- Loss of vision associated with alteration of level of consciousness
- Focal symptoms associated with migraine
- Confusion or amnesia alone
- Drop attacks alone