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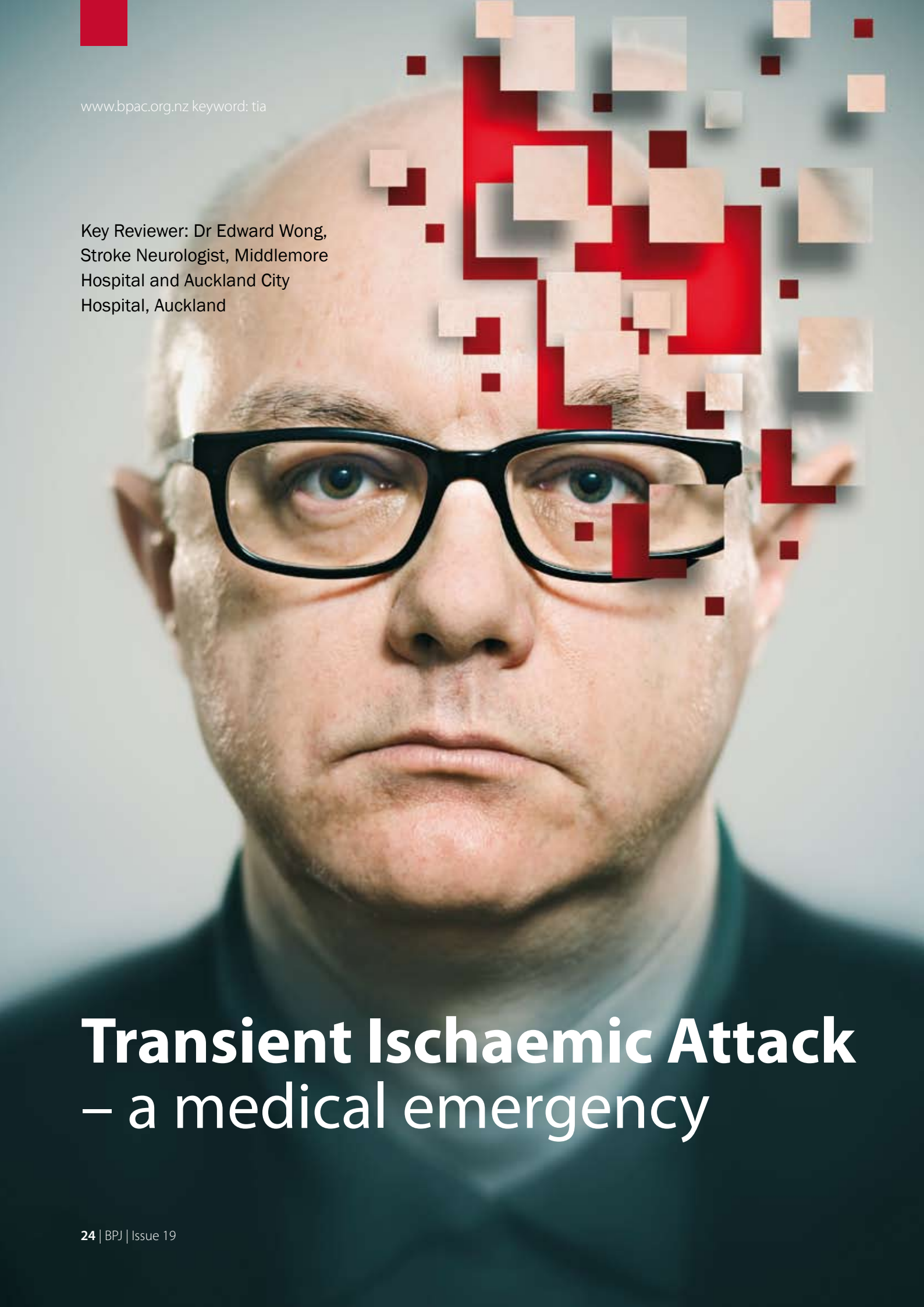

Transient Ischaemic Attack – a medical emergency

Key concepts[1]

- People with sudden onset of neurological symptoms should be screened for a diagnosis of stroke or TIA using a validated tool such as FAST
- If TIA is suspected:
  - Start aspirin immediately
  - Assess risk of stroke with the ABCD2 tool
  - If at high risk (ABCD2 ≥4) refer urgently for specialist assessment and investigation to occur within 24 hours of onset of symptoms
- As soon as a diagnosis of TIA is confirmed introduce secondary prevention

TIA is a warning

In one in four people a transient ischaemic attack (TIA) is a forerunner for a stroke,[2, 3] most of which occur in the first few days after a TIA.[4] Emergency referral for high-risk patients, urgent investigations and prompt treatment may prevent these strokes from occurring.

85% of strokes that follow a TIA will be fatal or disabling.[5] People with TIAs are also at high risk of non-stroke cardiovascular events e.g. myocardial infarction.

Benefit of early assessment and rapid intervention following TIA

There are several effective interventions for preventing stroke and other cardiovascular events following a TIA. Rapid diagnostic workup, appropriate early interventions such as carotid endarterectomy and commencement of secondary prevention have shown significant reduction in the 90 day risk of stroke following TIA (approximately 80% relative risk reduction).[6]

Guidelines for managing TIA and stroke may not be applicable to people with severe co-morbidities or a terminal illness but for most people the aim is to identify a TIA, start antiplatelet therapy and refer.

Recognising a TIA

A TIA may be thought of as a small stroke and shares similar signs and symptoms (Table 1):

- Rapid onset of symptoms – usually the patient or witness is certain when the event started
- Maximal neurological deficit at onset – progressive symptoms imply other diagnoses
- Focal symptoms typical of loss of blood supply to part of the brain
- Negative neurological symptoms (loss of function e.g. paralysis, weakness)

Most TIAs resolve within 60 minutes

Traditionally a TIA is defined as stroke signs and symptoms that resolve within 24 hours. However modern brain imaging now shows that most transient symptoms that last for more than one hour, are associated with detectable brain damage, and are in fact small strokes.

The clinical implications are that if symptoms are still present beyond one hour, then it can be assumed that this is likely to be a stroke.

Table 1: TIA symptoms (Adapted from NZ TIA Guideline 2008)[7]

Symptoms typical of TIA	Symptoms not typical of TIA*
Unilateral weakness: – face – arm – leg Unilateral altered sensation Dysphasia (speech deficit) Hemianopia Monocular Blindness	Generalised weakness or sensory symptoms Confusion (exclude dysphasia) Impaired consciousness or syncope Dizziness or light headedness Incontinence – bladder or bowel Amnesia Bilateral blurred vision or scintillating scotoma *If symptoms occur in isolation, without typical symptoms

Note – ataxia, vertigo, dysphagia, dysarthria and sensory symptoms to part of one limb or the face may be consistent with TIA if they occur in conjunction with other typical symptoms

Urgent assessment and intervention reduces the risk of stroke after TIA

Act FAST

The history of the event is crucial in making a diagnosis as often focal neurological signs have resolved by the time the patient presents. A witness's account can be invaluable.

A quick screening tool to aid the diagnosis of stroke or TIA is Face Arm Speech Test (FAST).[1] This may be performed on examination or retrospectively on history if the symptoms have resolved.

If time permits, further neurological examination to assess gaze and visual fields, limb ataxia and any sensory signs may be appropriate.

Likewise cardiovascular examination may be helpful to identify known risk factors:

- Neck bruit
- Atrial fibrillation
- Raised blood pressure
- Reduced or absent peripheral pulses
- Heart murmurs

Interventions

Step 1 – Medication

For those people with suspected TIA and no neurological deficit on examination, start aspirin (300 mg stat, and then 75–100 mg daily) if tolerated.[8]

If the patient is already on aspirin, special authority may be applied for to add dipyridamole.

Blood pressure reduction in the acute phase (prior to diagnosis being confirmed) is not recommended.

Step 2 – Speed of referral based on stroke risk

Urgency of referral depends on the stroke risk. This can be assessed with the ABCD2 tool.[9, 10]

High risk (≥4) – very rapid referral within 24 hours

ABCD2 scores of four and above are associated with higher likelihood of a true diagnosis of TIA and high risk of subsequent stroke (3.5% at two days and 5% at seven days.[11] Other high-risk patients include those with; symptoms at the time of assessment, more than one TIA in a week (crescendo TIAs), atrial fibrillation or those taking warfarin. High-risk patients require urgent assessment at a specialist centre, with access to brain and carotid imaging, within 24 hours of onset of symptoms.[12]

FAST

If possible check blood glucose. If <3.5 mmol/L treat and reassess once blood glucose is normal.

FACIAL WEAKNESS – Can the patient smile?

Ask patient to smile or show teeth.

- Look for new asymmetry – is there unequal smile or grimace, or obvious facial asymmetry?

ARM WEAKNESS – Can the person raise both arms?

Lift the patient's arms together at 90 degrees if sitting, or 45 degrees if supine, and ask them to hold in position for five seconds. Then let go.

- Does one arm drift down or fall down rapidly?

SPEECH PROBLEMS – Can the person speak clearly?

If the patient attempts conversation.

- Look for new disturbance of speech (check with witness)
- Look for slurred speech
- Look for word-finding difficulties. This can be confirmed by asking the patient to name commonplace objects that may be nearby, such as a cup, chair, table, keys, pen
- If there is a severe visual disturbance, place an object in the patient's hand and ask him/her to name it.

TIME TO REFER

If there is any neurological deficit, consistent with stroke or TIA, do not delay: Arrange to transfer the patient acutely to secondary care.

ABCD2 – prediction of stroke risk after TIA

	ABCD2 items (score: 0–7)	Points
A	Age: ≥ 60 years	1
B	Blood Pressure: ≥ 140/90mm Hg	1
C	Clinical features:	
	unilateral weakness or	2
	speech impairment without weakness	1
D	Duration of symptoms:	
	≥ 60 minutes or	2
	10–59 minutes	1
D	Diabetes: on medication/insulin	1

Low risk (≤3) – urgent referral within seven days

ABCD2 scores of three or less have a lower risk of stroke. These patients, plus those with higher scores but presenting more than one week following the TIA, may initially be managed in the community followed by specialist assessment and investigations within seven days of onset of symptoms. If the treating doctor is certain of the diagnosis, confident of initiating treatment and has ready access to brain and carotid imaging then specialist review may not be required.

Specialist review will confirm a diagnosis of TIA in approximately 50–80% of patients referred from the community.[13]

Initial investigations of TIA in primary or secondary care should include CBC, electrolytes, creatinine, fasting lipids, CRP, ESR (to rule out temporal arteritis) random glucose, INR (if on warfarin) and ECG.

Other possible investigations, usually performed in secondary care, are echocardiology, angiography, CXR, syphilis serology, vasculitis screen (ANA) and prothombotic screen (aPTT, PT).

Since TIA is a clinical diagnosis investigations include brain imaging to confirm cerebral ischaemia or haemorrhage and to exclude stroke mimics. Brain imaging is mandatory, to exclude intracranial haemorrhage as the cause of the current event, prior to commencing warfarin for atrial fibrillation.

Carotid imaging is appropriate in people, with carotid circulation symptoms (Table 2) who are fit for surgery. Urgent endarterectomy may be recommended for people with symptomatic severe stenosis of the internal carotid artery.

Step 3 – Begin early treatment as soon as TIA confirmed

As soon as a diagnosis of TIA is confirmed by a specialist, preventive measures to modify risk should be commenced. Antiplatelet and statin therapy should continue.

All patients should be offered information and personalised advice about how they can reduce their modifiable risks.[19] Any co-morbidities such as atrial fibrillation, diabetes, hypercholesterolaemia and hypertension should be intensively treated[20] (Table 3).

Secondary prevention to modify risk factors can reduce the risk of stroke by up to 80%.[21]

Table 2: Carotid and vertebrobasilar TIA symptoms

Carotid TIA	Vertebrobasilar TIA
▪ Monocular blindness ▪ Dysphasia ▪ Unilateral motor and/or sensory symptoms affecting face and limbs	▪ Cortical blindness ▪ Diplopia ▪ Isolated homonymous hemianopia or quadrantanopia ▪ Bilateral motor and/or sensory symptoms affecting face and/or limbs

Table 3: Modifiable risk factors for stroke following a TIA (excluding carotid endarterectomy). Adapted from LaRocque et al, 2008.[14]

	Risk	Recommendation
Lifestyle factors	Smoking	Smoking doubles stroke risk. All people who smoke should be strongly encouraged to stop immediately. (see BPJ 10 and smoking cessation guidelines)
	Alcohol	Avoid excessive alcohol: no more than two drinks/day for men and one drink/day for women.
	Body mass index	Encourage weight loss in those who are overweight. Aim for BMI of <25 kg/m^2 and waist circumference of <100 cm in men and <90 cm in women.
	Diet	Encourage a low fat, low sodium diet with 5+ portions a day of fruit and vegetables.
	Physical activity	Encourage an increase in physical activity to regular exercise 30–60 minutes most days of the week.
Medical therapies	Blood pressure lowering	Even small decrease in blood pressure reduces stroke risk by 20–25%. All people, whether normotensive or hypertensive should start antihypertensives within the first week, if tolerated. No specific blood pressure target can be recommended for all people.
		First-line ACE inhibitor +/– thiazide diuretic.
	Antiplatelet therapy,[8, 15] (see page 32)	Long term antiplatelet therapy should be prescribed to all people who are not on an anticoagulant.
		First-line aspirin plus modified release dipyridamole[16] (currently dipyridamole is only subsidised if a person continues to have TIAs while on aspirin, however this restriction is currently under review).
		Second-line aspirin or clopidogrel alone (not currently subsided for non-aspirin allergic patients).
	Anticoagulant therapy[17] (see page 38)	Should be used in all people who have atrial fibrillation, cardioembolic stroke from valvular heart disease or recent myocardial infarction once brain imaging has excluded intracranial haemorrhage.
	Cholesterol lowering	Statins should be prescribed for all people able to tolerate therapy. Aim for LDL <2.5 mmol/L.
	Diabetes management	Check for diabetes and manage in–line with national guidelines.[18]

Differential diagnoses

There is a wide differential diagnosis for a patient who presents with a history of transient neurological symptoms. Symptoms that make the diagnosis less likely are:

- Positive neurological symptoms – such as pins and needles, limb shaking or scintillating visual field abnormalities
- Global symptoms – such as confusion, faints, generalised numbness, bilateral blurred vision, isolated dizziness

Differential diagnoses of TIA:[7]

- Migraine aura, with or without headache
- Hypotension and/or syncope
- Transient episodes of non focal symptoms e.g. confusion
- Peripheral vestibular disorders – isolated vertigo that may have associated nausea and ataxia
- Partial (focal) epileptic seizures
- Anxiety and/or hyperventilation
- Transient global amnesia
- Drop attacks – sudden transient loss of postural tone causing falls
- Hypoglycaemia

Returning to driving after a TIA

In general driving is not safe in the early days and weeks after a TIA because of the significant risk of a stroke.

The Land Transport and Safety Agency recommend:

Single TIA

- Private licence: no driving for minimum of one month
- Commercial licence: no driving for minimum of six months and then specialist review.

More than one TIA

- Private licence: no driving for minimum of three months and return only if cause adequately investigated and treated.
- Commercial licence: no driving. Appeal possible with specialist support.

Resources

- Stroke Foundation of New Zealand TIA guideline 2008. www.stroke.org.nz
- New Zealand Guidelines Group. New Zealand smoking cessation guidelines, 2007. www.nzgg.org.nz
- New Zealand Guidelines Group. Assessment and management of cardiovascular risk, 2003. www.nzgg.org.nz
- New Zealand Guidelines Group. Management of type 2 diabetes, 2003. www.nzgg.org.nz
- Land Transport Safety Authority. New Zealand Medical fitness to drive, 2002. www.ltsa.govt.nznzlicensing/docs/ltsa-medical-aspects.pdf

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17. Sandercock PAG, Counsell C, Karmal AK. Anticoagulants for acute ischaemic stroke. Cochrane Database Syst Rev 2008;4:CD000024.
18. New Zealand Guidelines Group. Management of type 2 diabetes. 2003. Available from www.nzgg.org.nz (accessed January 2009).
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