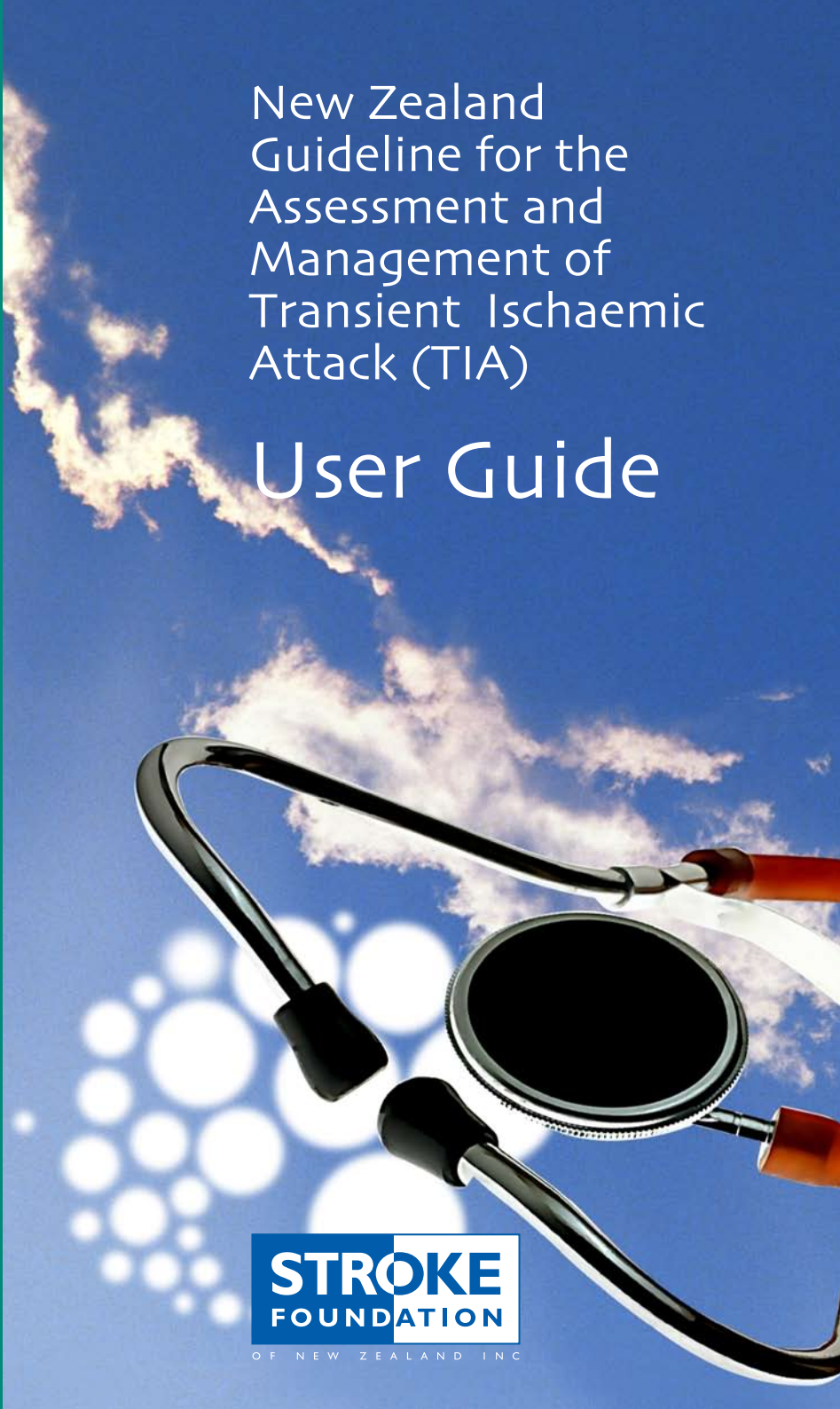
New Zealand Guideline for the Assessment and Management of Transient Ischaemic Attack (TIA)

User Guide



STROKE FOUNDATION OF NEW ZEALAND INC

Acknowledgements

The generous voluntary contribution of time and expertise by writers, consumers and commentators in the preparation of this guideline is acknowledged with gratitude.

Disclaimer

This TIA guideline was written to provide general guidance to health professionals and service providers. The information and recommendations contained within this guideline may not be appropriate for use in all situations and healthcare providers will need to use clinical judgment, knowledge and expertise to decide whether or not to apply its recommendations. Any decision must consider the wishes of the patient, the individual patient circumstances, the clinical expertise of the clinician and available resources.

Stroke Foundation of New Zealand Inc.
Po Box 12 482, Wellington
Phone: 0800 78 76 53
Fax: +64 4 472 7019
e-mail: *strokenz@stroke.org.nz*
www.stroke.org.nz

Index

Key Messages

TIA is a Medical Emergency – people with TIA are at high risk of early stroke!

- This risk can be as high as 12% at 7 days and 20% at 90 days
- About half of these strokes will occur within the first 48 hours after TIA
- Up to 85% of strokes that follow TIA will be fatal or disabling.

This risk is higher than that for chest pain. TIA warrants urgent attention.

The ABCD2 tool can identify people with TIA most at risk; usually those with unilateral weakness and/or speech disturbance, especially if symptoms last more than 60 minutes.

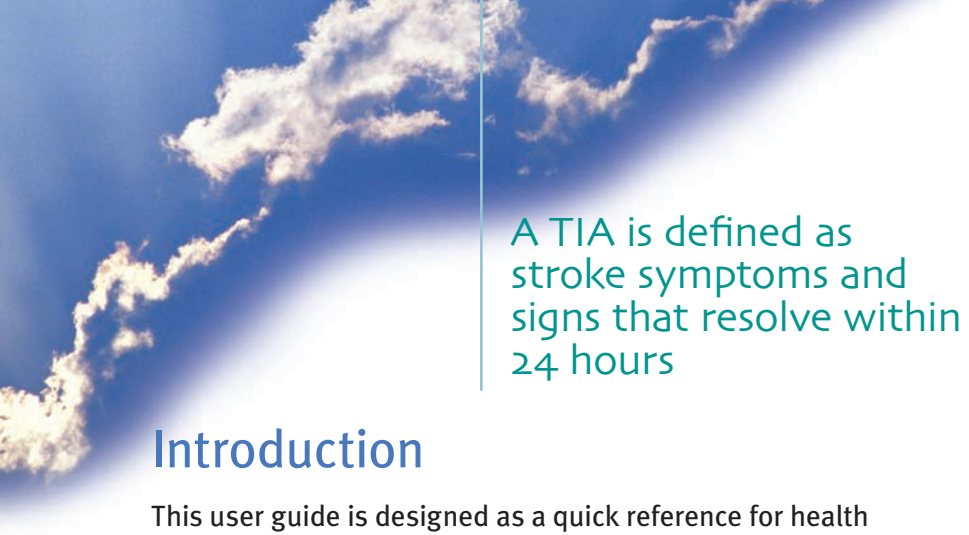
Diagnosis of TIA is more likely to be correct if the history confirms;

- Sudden onset of symptoms, with maximal neurological deficit at onset
- Symptoms typical of focal loss of brain function such as unilateral weakness or speech disturbance
- Rapid recovery of symptoms, usually within 30-60 minutes.

Urgent assessment and intervention reduces the risk of stroke after TIA

- Aspirin should be started immediately if fully recovered and no contraindications; 300mg stat if aspirin naïve and 75-150mg daily
- Risk Assessment. All people with suspected TIA should be assessed at initial point of health care contact for their risk of stroke, including their ABCD2 score

- People at high risk:
  - Include those with ABCD2 scores of 4 or more, crescendo TIAs, atrial fibrillation or who are taking anticoagulants
  - Require urgent specialist assessment as soon as possible but definitely within 24 hours.
- People at low risk:
  - Include those with ABCD2 scores of less than 4 or those who present more than one week after TIA symptoms
  - Require specialist assessment and investigations within 7 days
  - If the treating doctor is confident of the diagnosis of TIA, has ready access to brain and carotid imaging and can initiate treatment, then specialist review may not be required.
- Secondary prevention. As soon as the diagnosis is confirmed all people with TIA should have their risk factors addressed and be established on an appropriate individual combination of secondary prevention measures including:
  - Anti-platelet agent(s) - aspirin, aspirin plus dipyridamole or clopidogrel
  - Blood pressure lowering therapy
  - Statin
  - Warfarin - if atrial fibrillation or other cardiac source of emboli
  - Nicotine replacement therapy or other smoking cessation aid.
- Follow up, either in primary or secondary care, should occur within one month so that medication and other risk factor modification can be reassessed.



A TIA is defined as stroke symptoms and signs that resolve within 24 hours

Introduction

This user guide is designed as a quick reference for health professionals managing people presenting with a recent suspected TIA. For detailed information users should refer to the full *New Zealand Guideline for the Assessment and Management of Transient Ischaemic Attack,* available from *www.stroke.org.nz*

This user guide focuses on:

Diagnosis: Ensuring accurate diagnosis of TIA by clinicians working in primary care, emergency medical services and hospitals.

Stroke Risk Assessment: Promoting the determination of individual risk of stroke after TIA, particularly use of the ABCD2 tool.

Urgency of Assessment: Ensuring that the urgency of assessment and initial management of people with TIA are based on individual estimated risk of stroke.

Investigations: Streamlining the recommended investigation of people with TIA.

Secondary Prevention Measures: Ensuring appropriate secondary prevention measures are rapidly initiated for all people with TIA.

Driving Advice: Ensuring people get appropriate advice about driving after TIA.

1. Diagnosis

ARE YOU CONFIDENT IT WAS A TIA?

A TIA is defined as stroke symptoms and signs that resolve within 24 hours.

Diagnosis of TIA can be problematic. In primary care and emergency departments, the diagnosis of TIA is likely to be only 50 to 80% accurate with frequent over diagnosis.

A diagnosis of TIA is likely to be correct if history confirms;

- Sudden onset of symptoms. Usually people (or observers) can describe what they were doing at the time. If they are uncertain, TIA is less likely.
- Maximal neurological deficit occurs at onset. A progressive onset or a march of symptoms from one part of the body to another is more suggestive of epilepsy (if fast, over seconds to 1-2 minutes) or migraine (if slow, over several minutes).
- Focal symptoms consistent with vascular cause. Disruption of blood supply to a part of the cerebral circulation results in focal symptoms. Symptoms of generalised disturbance of neurological function such as confusion (unless mistaken for dysphasia), faints, generalised weakness or numbness, bilateral blurred vision, isolated dizziness and 'funny turns' are rarely due to TIA unless also accompanied by focal symptoms. (see *TIA symptoms table*).
- Loss of function. Typical symptoms of TIA are 'negative' due to loss of focal neurological function such as unilateral loss of movement or sensation, or loss of speech or vision. TIAs rarely cause positive symptoms such as pins and needles, limb shaking or scintillating visual field abnormalities.
- Rapid recovery. Most TIAs resolve within 30 minutes. If symptoms are still present beyond one hour then assume likely acute stroke.

The Face, Arm, Speech Test (FAST) may be used to screen for a diagnosis of stroke or TIA

TIA Symptoms

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

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.

Differential diagnosis of TIA in order of frequency as seen in primary care includes:

- Migraine aura, with or without headache
- Hypotension and/or syncope
- Transient episodes of non focal symptoms eg. confusion
- Peripheral vestibular disorders (isolated vertigo +/- secondary 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.

Assessment tools improve the accuracy of stroke and TIA diagnosis and facilitate rapid specialist review. In people presenting with sudden onset of neurological symptoms:

- Hypoglycaemia should be excluded as the cause of these symptoms
- The Face, Arm, Speech Test (FAST) may be used to screen for a diagnosis of stroke or TIA. However, TIA symptoms and signs will have resolved by time of presentation in most cases and FAST may need to be applied retrospectively.

FAST (Face Arm and Speech Test)

- Face Ask to smile; is it droopy on one side?
- Arm Ask to raise both arms to 90 degrees; does one drift down or fall rapidly?
- Speech Any new disturbances; slurring, word-finding or object-naming difficulty?
- Time If fails any of above tests get to hospital 'FAST'.

TIA needs urgent attention

2. Stroke Risk Assessment

Use the ABCD2 tool

People with TIA are at risk of stroke and other cardiovascular events including myocardial infarction and sudden death. This risk can be as high as 12% at 7 days and 20% at 90 days.

- About half of these strokes will occur within the first 48 hours after TIA
- Up to 85% of strokes that follow TIA will be fatal or disabling.

This risk is higher than that for chest pain. TIA warrants urgent attention.

The ABCD2 tool can identify those most at risk; usually those with unilateral weakness and/or speech disturbance, especially if symptoms last more than 60 minutes.

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

Risk of stroke according to ABCD2 scores

ABCD2 score:	0 – 3	4 – 5	6 – 7
Proportion of all TIAs	34%	45%	21%
Stroke Risk (%) at			
2 days	1.0	4.1	8.1
7 days	1.2	5.9	11.7
90 days	3.1	9.8	17.8

All people with suspected TIA should have a full assessment that includes determination of their stroke risk, using the ABCD2 tool at the initial point of health care contact whether first seen in primary or secondary care.

High Risk is indicated by any of the following:

- Active TIA – all people who still have symptoms when seen as they may be having a stroke
- ABCD2 score of 4 or more – especially those seen within 48 hours of their TIA or with highest ABCD2 scores (6 or 7) as these people are at substantial risk of early stroke

Each new stroke costs DHBs $50,000 in direct health costs

- Crescendo TIAs – people with two or more TIAs within a week are acutely unstable and at high risk of early stroke
- Atrial Fibrillation – people with atrial fibrillation are at risk of cardioembolic stroke and may require urgent anticoagulation
- Anticoagulation – people who are already on anticoagulation require urgent specialist review for brain imaging and treatment modification.

Low Risk is indicated by any of the following:

- ABCD2 score of 3 or less – these people are at low risk of early stroke, about one in a hundred by one week and one in thirty by 90 days
- Late Presentation – people who present more than one week after their last TIA should be managed as low risk as only a third of strokes occur beyond this time.

3. Urgency of Assessment

should be according to risk of stroke

Reorganisation of services to facilitate prompt specialist assessment and early initiation of secondary prevention measures can reduce the risk of a stroke after TIA by up to 80%. Based on a generally accepted figure of $50,000 per new stroke in direct health costs funded by District Health Boards (DHBs), a relatively low number of strokes need to be prevented after TIA to justify intensification of services for people with TIA.

The most cost effective service is immediate specialist assessment for all people identified as high risk (a seven day stroke risk of >4%) including those with an ABCD2 score of four or more.

Each DHB should have locally agreed protocols for the assessment and management of people with recent TIA, irrespective of where they are initially seen. A TIA service can be provided by an open-access daily specialist outpatient clinic, an inpatient short-stay facility or a combination of these services. In many hospitals this will be by general medical services, using agreed protocols.

High Risk:

Most people at high risk of stroke should be transferred urgently to hospital to facilitate rapid specialist assessment and treatment within 24 hours; preferably to an open-access specialist TIA clinic or a short stay unit.

Low Risk:

Most people at low risk of stroke may initially be managed in the community and referred to a specialist clinic, and should be seen within 7 days.

Do all people with TIA need specialist review?

If the treating doctor has ready access to brain and carotid imaging, and is confident about the diagnosis and implementing recommended treatments, then some people with TIA who are assessed as low risk may not require specialist review.

Recommendations for urgent assessment, specialist review and treatments may not be appropriate if TIA occurs in the setting of terminal illness, severe disability or dementia.

People with TIA should have brain imaging

4. Investigations

Vascular risk factor assessments

All people with TIA should be assessed for the following vascular risk factors at their first assessment:

- Hypertension
- Atrial Fibrillation
- Ischaemic Heart Disease and/or Peripheral Vascular Disease
- Diabetes
- Cholesterol
- Smoking History
- Alcohol Consumption.

Routine tests

Investigation	Purpose
Electrocardiogram	Atrial Fibrillation, myocardial infarction
Full Blood Count	Polycythaemia, thrombocytosis
Renal function and electrolytes	Renal impairment, potential medication reactions
Cholesterol	Vascular risk factor assessment, monitor targets
Glucose	Vascular risk factor assessment, hypoglycaemia
ESR or CRP (selected people)	Giant cell arteritis, vasculitis

Brain imaging: All people with TIA should have brain imaging, either MRI or CT.

- If high risk this should be done urgently, but certainly within 24 hours
- If low risk this should be done within 7 days.

Carotid imaging: Candidates for carotid imaging (should be done within 1 day if high risk or 7 days if low risk) and carotid endarterectomy (should be done within 2 weeks) usually meet the following criteria;

- Anterior circulation TIA symptoms such as all those with dysphasia or other cortical symptoms, transient monocular blindness and most with unilateral weakness
- Fit for surgery, if this can be performed by a specialist surgeon with low rates of perioperative mortality and morbidity.

Begin early aggressive treatment to 'BEAT' TIA

5. Secondary Prevention Measures

To 'BEAT' TIA – Begin Early Aggressive Treatment

Treatment must be initiated at first contact whether the person with TIA attends their GP, emergency department, out-of-hours medical centre or similar providers.

Key Secondary Prevention Recommendations

All people with suspected TIA should have;

- Aspirin started immediately if fully recovered and not contraindicated, 300mg stat and 75 – 150mg daily
- A discussion about their individual vascular risk factors
- Secondary prevention started as soon as the diagnosis is confirmed including; an appropriate individual combination of:
  - Anti-platelet agent(s) such as aspirin, aspirin and dipyridamole or clopidogrel
  - Blood pressure lowering therapy
  - Statin.
- Follow up, either in primary or secondary care, within one month so that medication and other risk factor modification can be reassessed.

Behaviour Change and Lifestyle Modification

Every person with TIA should be assessed and informed of their risk factors for stroke and other cardiovascular events, and possible strategies to modify these, including:

- Smoking cessation: nicotine replacement therapy, bupropion or nortriptyline therapy, nicotine receptor partial agonist therapy and/or behavioural therapy
- Improving diet: a diet that is low in fat (especially saturated fat) and sodium, but high in fruit and vegetables should be consumed
- Weight-reducing diet for people with an elevated body mass index
- Increasing regular exercise and physical activity
- Avoiding excessive alcohol consumption.

For Māori and Pacific people, involvement of whānau and culturally appropriate service providers is advised, where these are available.

Anti-platelet agents

Aspirin remains the most readily available, cheapest and most widely used anti-platelet agent in people with TIA. Aspirin plus modified release dipyridamole twice daily and clopidogrel alone are more effective than aspirin alone, although the numbers needed to treat are greater than 100 to obtain benefit above aspirin alone.

Every person with TIA needs to understand their risk factors

Aspirin

- Give 300mg stat if aspirin naïve and 75 – 150mg daily for all people with suspected TIA unless aspirin is contraindicated
- If person has fully recovered, it is reasonable to start aspirin pending brain imaging as 99% of strokes after TIA are ischaemic, intracerebral haemorrhage (ICH) rarely causes TIA and inadvertent short-term use of aspirin in stroke patients subsequently shown to have ICH has not been shown to cause harm
- If already on aspirin add dipyridamole or change to clopidogrel.

Dipyridamole

- The dipyridamole dose funded by PHARMAC in New Zealand is 150mg SR twice daily whereas available evidence supports a 200mg modified release dose twice daily
- There is a significant dropout rate with dipyridamole due largely to headache. Adherence may be improved if people are advised that side effects may resolve after several days therapy or if dose is temporarily reduced and reintroduced gradually, for example using dipyridamole 150mg SR once daily at night for one week before increasing to twice daily.

Clopidogrel

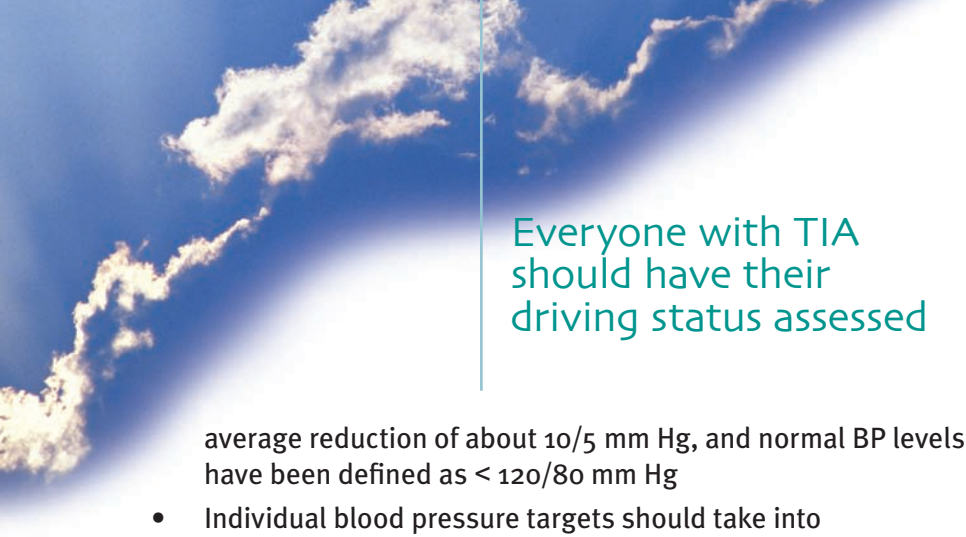
- Give 300mg stat and 75mg daily. Clopidogrel is as effective as the combination of dipyridamole and aspirin but is better tolerated
- At the time of writing, PHARMAC special authority approval is required for funding of clopidogrel. Some people may choose to pay for clopidogrel.

Warfarin

- Anticoagulation with Warfarin is recommended for every person with TIA if atrial fibrillation (paroxysmal or permanent) or other cardiac source of emboli is identified, unless contraindicated
- Brain imaging must be done first to exclude haemorrhage or other pathology
- Target INR of 2.5 (range 2 – 3) is recommended
- The potential risks and benefits of anticoagulation therapy should be discussed with the person and where appropriate their family/whanau, and this discussion and its outcome should be documented.

Blood pressure-lowering treatment

- All people with TIA, whether normotensive or hypertensive, should receive blood pressure-lowering therapy, unless contraindicated by symptomatic hypotension
- Treatment should be initiated at first contact but BP should not be lowered rapidly
- More than one drug is frequently required to lower BP to optimum levels. An ACE-inhibitor with a thiazide diuretic is an appropriate combination
- The absolute target BP level is uncertain and should be individualized, but benefit has been associated with an



Everyone with TIA should have their driving status assessed

average reduction of about 10/5 mm Hg, and normal BP levels have been defined as < 120/80 mm Hg

- Individual blood pressure targets should take into account the number and dose of medications as well as co-morbidities and frailty, especially in older people.

Cholesterol lowering treatment

- Therapy with a statin is recommended for all people after TIA
- Simvastatin is funded by PHARMAC as initial statin therapy in NZ. Initial dose is simvastatin 40mg although a lower dose (20mg and titrate up) may be more appropriate in older people or those with frailty
- At the time of writing PHARMAC special authority approval is required for more intensive therapy with atorvastatin 80mg daily
- Benefit occurs even in those with normal baseline cholesterol
- LDL cholesterol (optimal level < 2.5 mmol/L) should be used to monitor therapy.

Carotid Surgery

- People with TIA who have at least 50% symptomatic carotid stenosis should be assessed and if a surgical candidate, be referred for carotid endarterectomy within one week (one day if high risk), and receive treatment within a maximum of 2 weeks of onset of symptoms.

6. Driving Advice

All people with TIA should have their driving status assessed, be advised about the impact of their TIA on their ability to drive and this advice should be documented.

Heath practitioners should refer to the Land Transport NZ document *Medical Aspects of Fitness to Drive* for full advice regarding driving after a TIA. This is available at *www.ltsa.govt.nz/licensing/docs/ltsa-medical-aspects.pdf*

Summary of Land Transport recommendations for driving after TIA

Private licence – generally class 1 (private motor vehicles) or class 6 (any motorcycle).

- Single TIA: No driving for minimum one month after a single TIA
- Multiple TIAs: No driving for a minimum three months provided the condition has been adequately investigated and treated.

Vocational licence – generally classes 2 – 5 (heavy commercial motor vehicles including those towing trailers) and/or a P, V, I or O licence endorsement.

- Single TIA: No driving for a minimum six months and only if the cause has been identified and satisfactorily treated, including a specialist medical assessment. Note these people may resume private vehicle driving after minimum one month
- Multiple TIAs: People should not return to vocational driving. However, the Director of Land Transport may consider granting a licence 12 months after the last attack if an appropriate specialist report supports such an application.

Further Information

For detailed information users should refer to the full *New Zealand Guideline for the Assessment and Management of Transient Ischaemic Attack*, available from *www.stroke.org.nz*

Information about TIA and stroke is available from the Stroke Foundation of New Zealand
(Tel: 0800 787653 or 0800 STROKE, *www.stroke.org.nz)*

Authors

John Gommans
Honorary Medical Advisor, Central Region, Stroke Foundation of New Zealand
Physician and Geriatrician, Hawke's Bay District Health Board

P Alan Barber
Honorary Medical Advisor, Northern Region, Stroke Foundation of New Zealand
Neurological Foundation Professor of Clinical Neurology, University of Auckland and Stroke Neurologist, Auckland District Health Board

John Fink
Honorary National Medical Director, Stroke Foundation of New Zealand
Neurologist, Canterbury District Health Board

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0800 78 76 53
www.stroke.org.nz

Is it a Stroke? Act FAST. Call 111.

Face *- SMILE (is one side droopy?)*

Arms *- RAISE BOTH ARMS (is one side weak?)*

Speech *- SPEAK A SIMPLE SENTENCE (slurred? unable to?)*

Time *- Lost time could be lost brain, get to hospital FAST*

Stroke is a medical emergency.