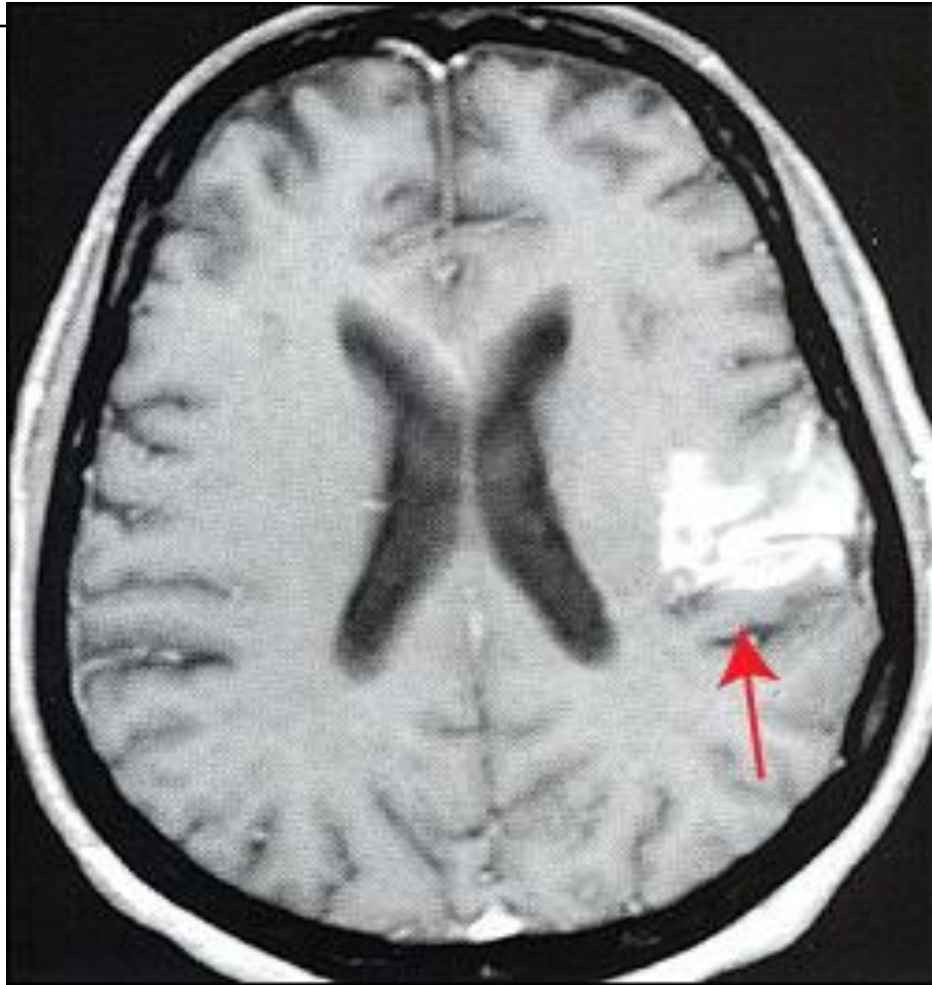


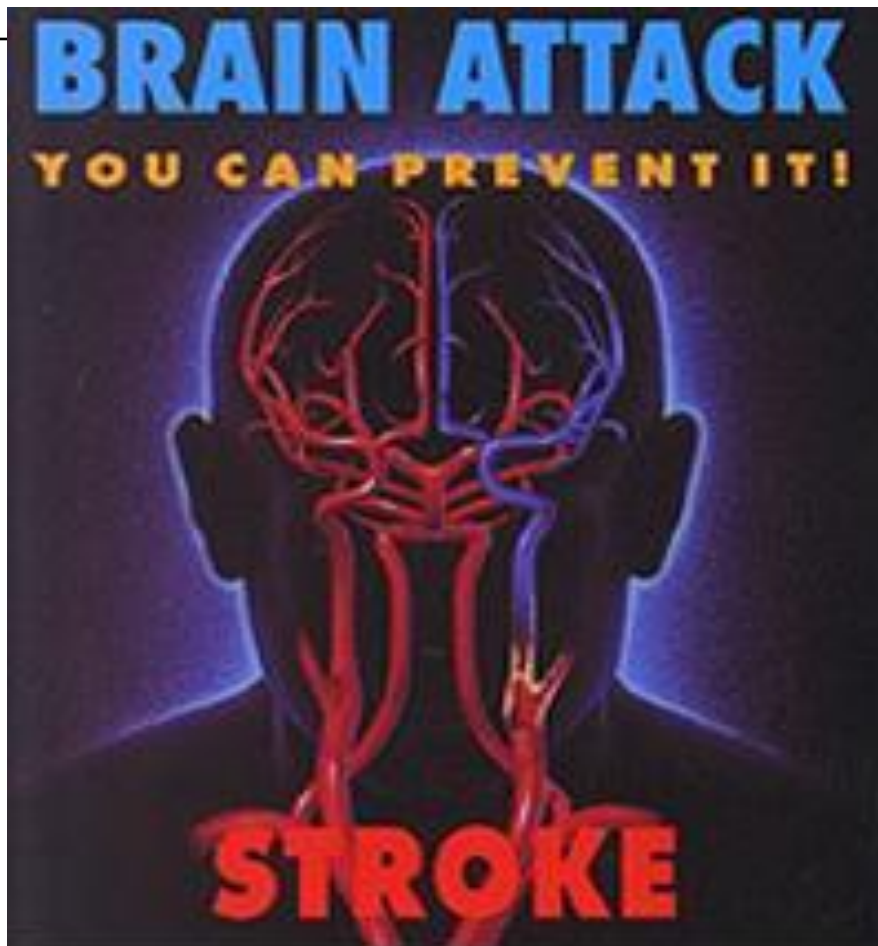
# **Optimum management of TIA and NZ TIA guidelines**

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**“What do Doctors Need to Know?”**

# MRI





*Image courtesy of National Stroke Association*



# Making Diagnosis

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- How easy/difficult is it ?

# What is TIA ?

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- Sudden onset of focal neurological symptom and/or sign that lasts less than 24 hours and is presumably brought on by a transient decrease in blood supply which renders the brain ischaemic in the area producing the symptom.
- Tissue diagnosis. absence of brain damage

# Brain Injury

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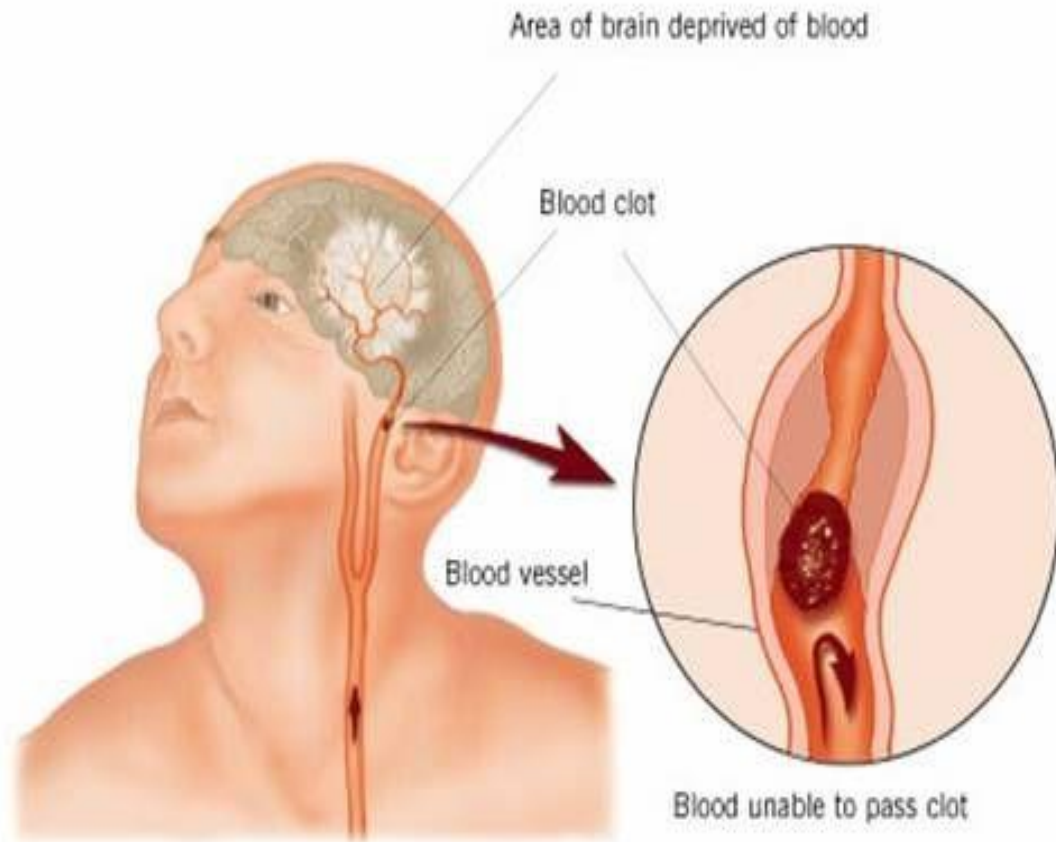
- 50% patients with clinical TIA syndromes have corresponding appropriate lesions on brain MRI
- Transient Symptoms associated with infarction (TSI)...unstable
- Most TIA are less than 30 Minutes
- More than 2 hours; deficit on MRI



# Pathophysiology

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1. Blood Vessel Disease
  - a. Atherosclerosis
  - b. Embolus
2. Extra-cranial
  - a. Cardiac
3. Inadequate Blood Flow
  - a. Low BP
  - b. Hyperviscosity





# Is this a TIA?

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- Scenario 1.
- 40 year old woman,
- Risk Factor: Cholesterol 6.6
- Acute onset Right sided headache,
- Numb right side
- Symptoms still present next morning

# Is this a TIA?

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- Scenario 2
- 86 year old woman at lunch with family
- Unresponsive, shaking , incontinent urine
- NIDDM, Treated BP, On statin
- Bilaterally up-going plantars
- Urine positive wbc, blood, nitrites



# Is this a TIA?

---

- Scenario 3
- 82year old woman
- Traveling with her husband
- Had problems with her memory and orientation
- Memory and orientation remains poor
- Diet controlled NIDDM



## Is this a TIA?

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- 65 year old man
- Hypertension
- On aspirin and statin
- Collapses and loses consciousness for ? one minute
- Speech garbled, felt weak



## Is this a TIA ?

---

- Scenario 5
- 60 year old woman
- Hypertension
- Sudden loss of vision in left eye



# Not typical of TIA

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- Confusion ( exclude dysphasia)
- Memory loss
- Dizzy or light headed
- General weakness or sensory symptoms
- Fainting or syncope
- Incontinence
- Bilateral blurred vision, scintillating scotoma

# What symptoms suggest TIA

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- Acute, all symptoms at outset
- Rapid recovery; > 1 hour CVA likely
- Unilateral weakness: 50%
- Unilateral loss of sensation: 35%
- Dysphasia: 18%
- Monocular blindness (5%)



# Consistent if with other symptoms

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- Dysarthria
- Ataxia
- Vertigo
- Diplopia
- Dysphagia

# Differential diagnosis

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- Migraine +/- headache
- Hypotension/Syncope
- Transients episodes of NON FOCAL symptoms e.g. confusion
- Peripheral Vestibular Disorder; isolated vertigo +/- nausea, ataxia
- Partial seizure
- Transient Global Amnesia
- Hypoglycaemia

# User Guide

“Short Version” of  
TIA Guideline

**Contents** include...

Diagnosis

Stroke risk assessment

Urgency of assessment

Investigations

Secondary prevention

Driving advice

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

User Guide

# TIA Guideline

## Origin

- Ministry of Health
- Diabetes & CV Disease QIP 2008

## Authors

- John Gommans
- Alan Barber
- John Fink

## Reference Document

Stroke Foundation of NZ

[www.stroke.org.nz](http://www.stroke.org.nz)

24 October 2008

NEW ZEALAND GUIDELINE

FOR THE ASSESSMENT  
AND MANAGEMENT OF  
PEOPLE WITH RECENT  
TRANSIENT ISCHAEMIC  
ATTACK (TIA)



**STROKE**  
FOUNDATION  
OF NEW ZEALAND INC

# Guidelines have limitations...

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- Provide **general guidance** to clinicians and service providers.
  - **may not be appropriate** for use in **all** situations.
  - Clinicians need to use **clinical judgment** and expertise to decide whether or not to apply recommendations to **individual patients**.
  - Any decision must consider the **patient's wishes** and circumstances.

# NZ TIA Guideline - What is New?

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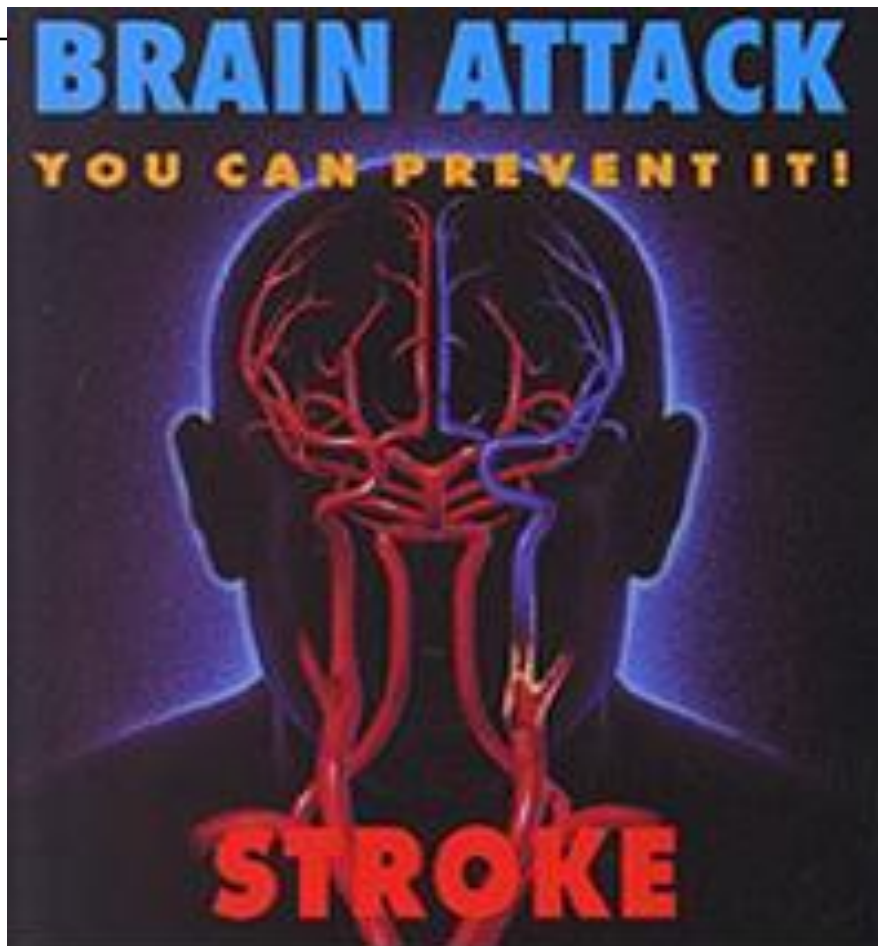
## Key Messages for Physicians...

- 1. TIA is a medical emergency**
- 2. You can predict an individual's risk of stroke after TIA**
- 3. Early specialist assessment and intervention prevents strokes**
- 4. DHBs should invest in TIA services**

# 1. TIA is a Medical Emergency

---

- Risk of stroke after TIA can be as high as...
  - 12% (1 in 8) risk of stroke within next 7 days
  - 20% (1 in 5) stroke risk at 90 days  
ABCD2 study - Johnston et al. Lancet 2007
- Half of these strokes will occur in first 48 hours
  - many within hours of TIA  
Johnston et al. Lancet 2007, Chandratheva ESC 2008
- Strokes after TIA are severe
  - 21% fatal
  - 64% disabling  
Johnston et al. JAMA 2000



*Image courtesy of National Stroke Association*

# Management of people with transient chest pain vs. neurological symptoms

---

## **Chest pain**

(angina?)

- Call 111
- Urgent ED triage
- Immediate ECG, bloods
- Monitored 6-24 hrs
- ETT & specialist review before discharge

## **Neurol Symptoms.**

(TIA?)

- Public doesn't recognise
- Primary care & EMS may not react with urgency
- DHB services can't or don't respond with urgency

# To manage TIA as a Medical Emergency Requires...

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- Education of Public, GPs & Emergency Services
  - Risk of TIA &
  - Need for rapid response
- DHB TIA services able to respond urgently
  - Specialist assessment
  - Investigations including imaging
  - Treatment

## 2. You can predict an individual's Risk of Stroke after TIA

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*"All people with suspected TIA should be assessed at initial point of health care contact for their risk of stroke, including their ABCD2 score"*

- ABCD2 score will identify those at most risk
  - usually if unilateral weakness +/- speech disturbance
    - ABCD - Rothwell et al. Lancet 2005, ABCD2 - Johnston et al. Lancet 2007
  - ABCD2 is a **triage** tool, an aid to and not a substitute for clinical decision making in individual patients
  - Other factors also contribute to risk of stroke, such as
    - crescendo TIA, atrial fibrillation...
    - carotid stenosis, lesions on brain imaging...



# FAST

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- FACE: smile, unilateral drooping face
- ARM: Raise both arms; look for droop
- Speech: Slurred, word-finding/naming problems
- TIME... if fails any of the above get to hospital FAST....
- STROKE is a MEDICAL EMERGENCY

---

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

*Stroke is a medical emergency.*



# Stroke Assessment

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- For those in High Risk category with TIA the risk of stroke can be as high as 12% at 7 days and 20% at 90 days
- Half of all these strokes occur in the first 48 hours
- Up to 85% of strokes following TIAs are fatal or disabling

# ABCD2 - stroke risk after TIA

on et al. Lancet 2007

<b>A</b>	<b>Age:</b> $\geq$ 60 years	1
<b>B</b>	<b>Blood Pressure:</b> $\geq$ 140/90mm Hg	1
<b>C</b>	<b>Clinical features:</b>	
	unilateral weakness or	2
	speech impairment without weakness	1
<b>D</b>	<b>Duration</b> of symptoms:	
	$\geq$ 60 minutes or	2
	10-59 minutes	1
<b>D</b>	<b>Diabetes:</b> on medication/insulin	1

# Risk of stroke by ABCD2 scores

ton et al. Lancet 2007

<b>ABCD2 score:</b>	<b>0 – 3</b>	<b>4 – 5</b>	<b>6 – 7</b>
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
<b>90 Days</b>	<b>3.1</b>	<b>9.8</b>	<b>17.8</b>

# Risk of stroke by ABCD2 scores

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90 Days	3.1	9.8	17.8

# Risk of Stroke after TIA

*(NZ TIA Guideline)*

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- **High Risk** is indicated by any of...
  - **ABCD2 score of 4 or more** *(NZ TIA & RCP)*
  - Crescendo TIA (2 or more TIA in week)
  - Atrial Fibrillation
  - On anticoagulants
- **People at High Risk**
  - Require urgent specialist assessment as soon as possible but definitely within 24 hours *(NZ TIA)*
  - Most should be transferred urgently to hospital to facilitate rapid specialist assessment and treatment *(European B)*

# Risk of Stroke after TIA

*(NZ TIA Guideline Definitions)*

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- **Low Risk** is indicated by any of...
  - **ABCD2 score of 3 or less** (1% 7 day risk)
  - Late presentation, more than one week after TIA (as 2/3 of strokes will occur within first 7 days)
- **People at Low Risk**
  - Require specialist assessment and investigations within 7 days *(NZ TIA)*
  - If the treating doctor (ED, GP) is confident about the diagnosis, can implement recommended treatments, and has access to brain and carotid imaging within 7 days, then specialist review of people at low risk may not be necessary. *(NZ TIA)*

### 3. Urgent specialist assessment & intervention prevents strokes!

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Meta-analysis shows a strong correlation between the risk of early stroke after TIA and...

- the **urgency** of intervention and
- degree of **specialisation** of stroke services

Giles & Rothwell. Lancet

Neurol 2007

- **The lowest risks occurred with emergency management by specialised stroke services.**

# EXPRESS & SOS-TIA studies

Rothwell et al. Lancet 2007 (EXPRESS)

Chaturvedi et al. Lancet Neurol 2007 (SOS-TIA)

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## Message for NZ...

- Feasible to reorganise or create services that facilitate urgent specialist assessment and early initiation of secondary preventative therapy.
  - A daily open-access clinic (e.g. Mon-Fri, afternoons)
  - An acute 24/7, short-stay inpatient unit (e.g. Stroke Unit)
- Doing this can significantly reduce the risk of stroke after TIA, by as much as 80% (NNT 12-21).

Discussion in Full TIA Guideline

# BEAT TIA & Prevent Strokes

## “Begin Early Aggressive Treatment”

---

### **As soon as diagnosis suspected...**

- Start aspirin stat!

### **As soon as diagnosis confirmed...**

- Aspirin, aspirin+dipyridamole, or clopidogrel
- BP lowering therapy (start or increase)
- Statin
- Smoking cessation
- Anti-coagulate, if in atrial fibrillation
- Carotid investigations (in selected patients) & surgery within 2 weeks, if significant stenosis

# Immediate Aspirin!

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- **“Aspirin** should be started **immediately** in all people with **suspected** TIA without delaying for results of brain imaging”
  - **if fully recovered (i.e. not stroke)**
  - **no contraindications**

SOS-TIA 2007, RCP 2008, NZ TIA 2008
  - 300mg stat if aspirin naïve & 75-150mg daily.

# Aspirin before Brain Imaging?

---

- Haemorrhage (ICH) is a very rare cause of TIA
- 99% strokes after TIA are ischaemic, not ICH  
Johnston et al. Lancet 2007
- Risk of stroke within hours after TIA  
Chandratheva ESC 2008, Johnston et al. Lancet 2007
- No clear evidence that giving aspirin to patients with ICH prior to imaging causes harm
  - In 671 patients with ICH inadvertently randomised into IST & CAST, those allocated aspirin had **lower** odds of a poor outcome (OR 0.68, 95% CI 0.49-0.94).  
Sandercock, Cochrane review 2008

## If already on aspirin...

### **Add dipyridamole or change to clopidogrel.**

---

- Clopidogrel alone and combination of Aspirin plus modified release dipyridamole (twice daily) are both more effective than aspirin alone
  - NNT > 100 to obtain benefit above aspirin alone
  - Equally effective (PROFESS NEJM 2008)
  - Clopidogrel better tolerated
  - NZ Dipyridamole is 150mg SR BD (not 200mg)
- Choose according to; tolerability, any IHD, PHARMAC criteria or patients ability to fund.
- Specialist authority approval asap...



# Driving after TIA

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One month stand down

More than one TIA....review safety to  
drive

## 4. DHBs should invest in TIA services to prevent stroke

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- Strokes are expensive!
  - Direct costs to DHB > \$50,000 per stroke
  - TIA incidence (NZ) approx 1/1000 per year
- TIA service should be good investment
  - Don't need to prevent many strokes at \$50,000 to justify some investment
  - Most components of TIA service already exist
  - Organise existing stroke services

# Summary - Key Messages...

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- TIA is a medical emergency
- ABCD2 score identifies those at most risk
- Urgent specialist assessment & urgent intervention prevents strokes
- Begin Early Aggressive Treatment to BEAT TIA
  - Aspirin stat, and other antiplatelet agents
  - BP lowering therapy
  - Statin therapy
  - Stop smoking, anticoagulate AF, carotids etc.
- All DHBs need locally agreed protocols for management of TIA – **use the guideline!**

# NZ 2008 - where are people with suspected TIA usually seen?

Brownlee et al. NZMJ Submitted 2009

<u>Where</u>	<u>NZ Pop. (%)</u>	<u>DHBs (n/21)</u>
○ ED	62%	13
○ AAU	9%	2
○ Med Ward	9%	2
○ Stroke Unit	5%	1
○ OP Clinic	15%	3

waiting time > 1 week

# Options for DHB TIA services?

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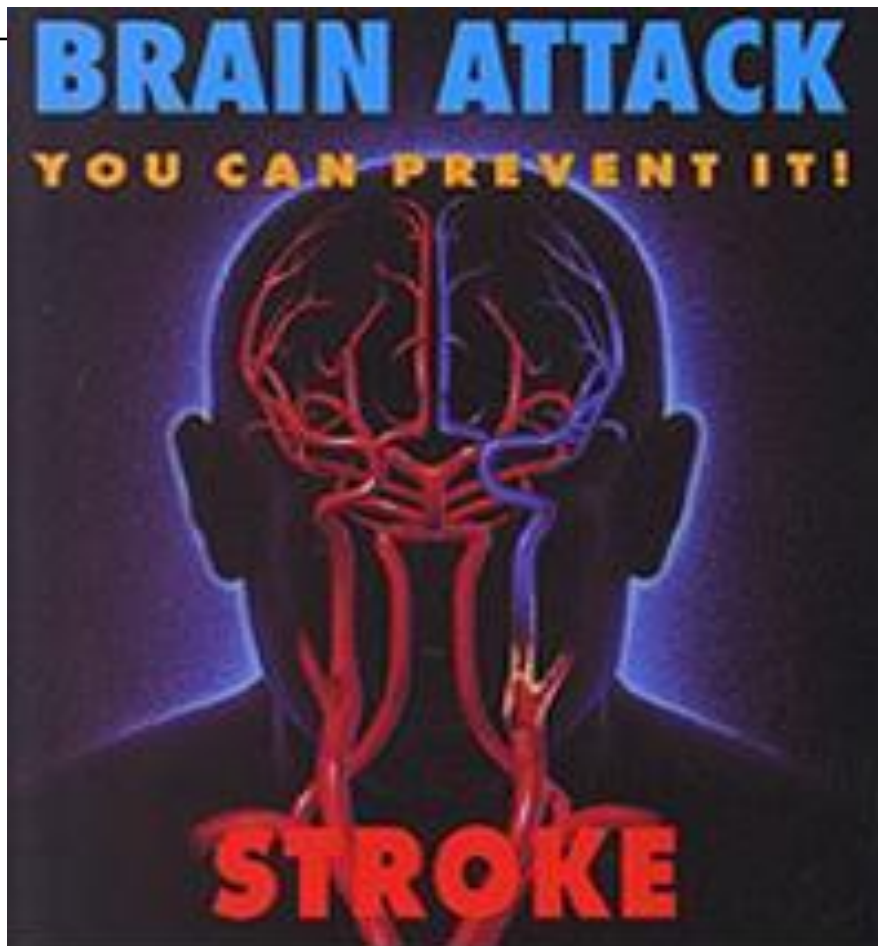
- Open-access daily specialist outpatient clinic
  - e.g. larger DHBs, Mon-Fri (pm)
- Short-stay inpatient facility
  - e.g. stroke units or acute/medical assessment units
- Specialist general (internal) medicine services using agreed protocols
  - emergency department or admission to medical unit
  - e.g. smaller DHBs, out of hours other DHBs
- OP clinics or GP services - if at low risk

**A combination of these services.**

# Key issues for DHB TIA services...

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- **Locally agreed protocols** for the assessment and management of people with recent TIA
  - irrespective of where/when they are initially seen
- TIA services must allow **urgent access to...**
  - specialist assessment and
  - investigations and
  - initiation of therapy
- Based on an **individual's risk** of stroke
  - **High Risk** = same day for most patients (urgent transfer to hospital) and definitely within 24 hours
  - **Low risk** = within 7 days **but start treatment stat.**

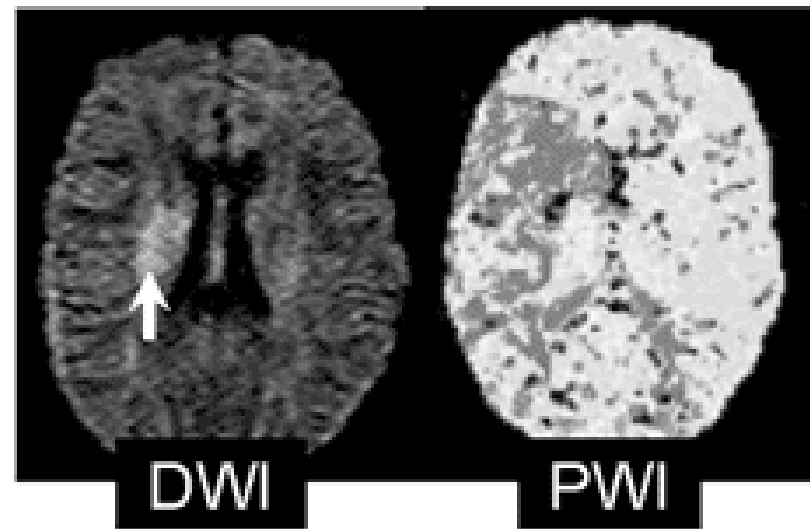
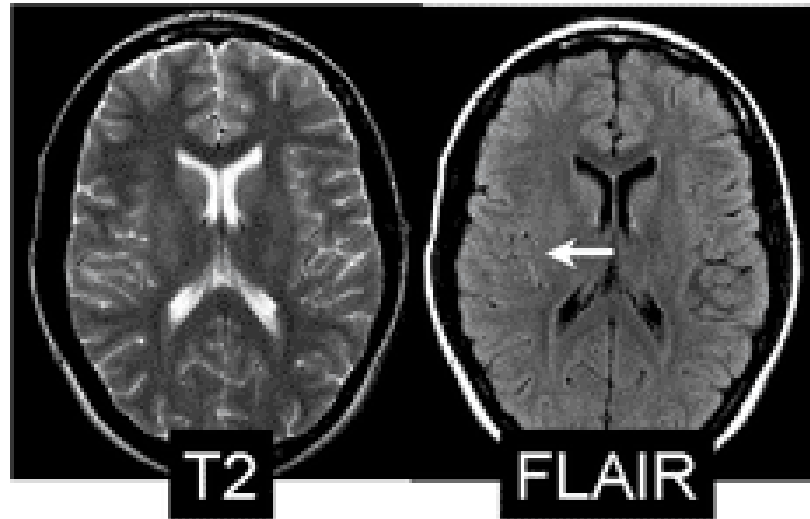


*Image courtesy of National Stroke Association*

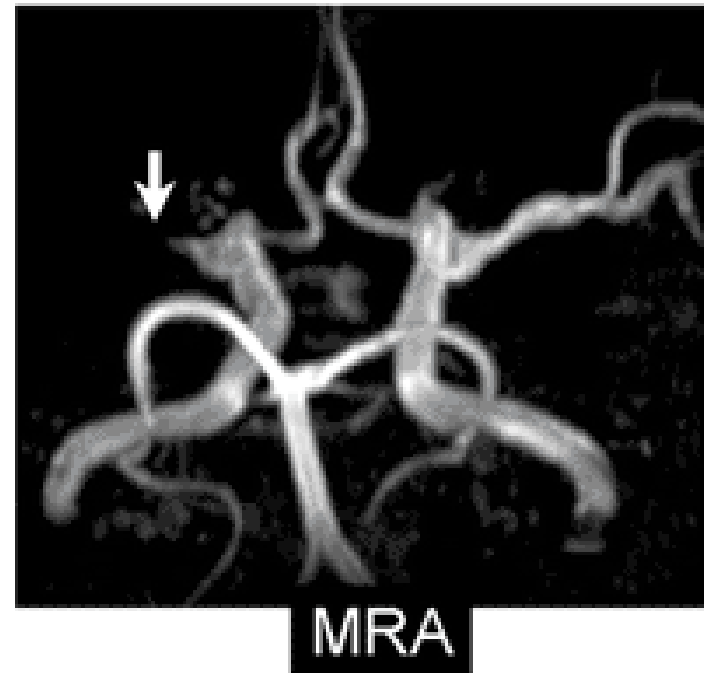
# THROMBOLYSIS

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NNT				
Time minute	0-90	91-180	181- 270	271- 360
NNT benefit	3.6	4.3	5.9	19.3
NNT harm	65	38	30	14



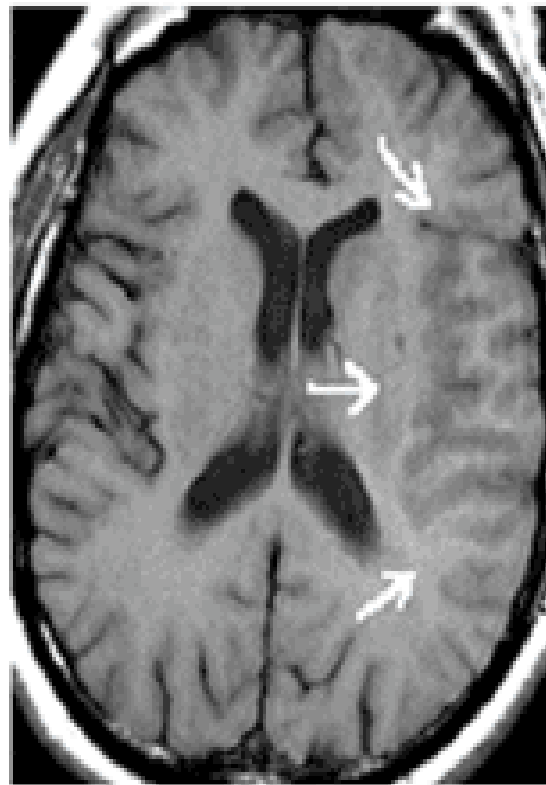
# Hyperacute Stroke



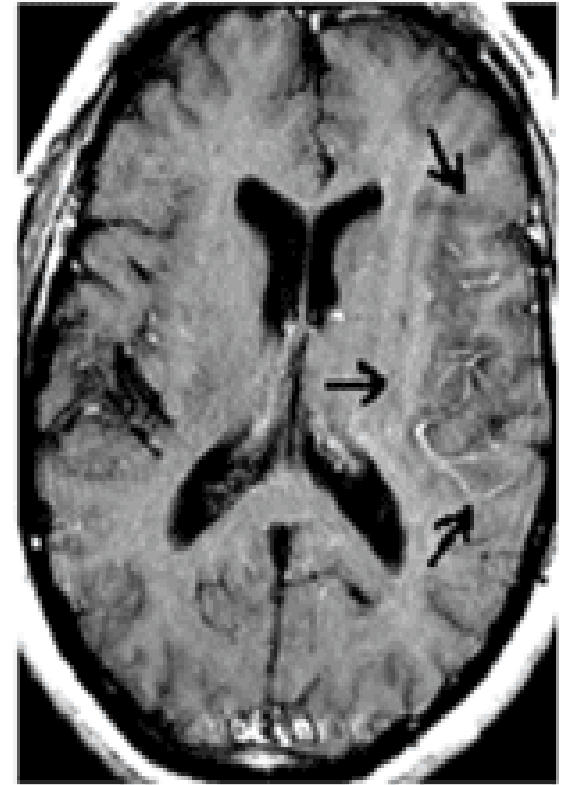
# MRI of Acute Stroke



T2



T1-non



T1-gad

- 
- **Figure 7.** MRI of hyperacute stroke at 2 hours postictus. The T2-weighted image is normal. The FLAIR image shows hyperintense vessels (HVS - see text) in the territory of the middle carotid artery (MCA) (arrow), consistent with slow arterial flow, but the FLAIR shows no tissue abnormality. Diffusion-weighted imaging (DWI) shows hyperintensity in the deep middle cerebral artery territory consistent with cytotoxic edema in an acute stroke (arrow), but there is no evidence of cortical ischemia. Perfusion-weighted imaging (PWI) (time-to-peak image) shows reduced perfusion in the full (cortical and subcortical) MCA territory. This suggests a much larger area of tissue at risk than shown by DWI or conventional images. This is known as a diffusion-perfusion mismatch (see text). Some areas of reduced perfusion show HVS on FLAIR whereas others do not. Three-dimensional time-of-flight magnetic resonance angiography (MRA) confirms a proximal MCA occlusion or severe stenosis.[35]

# Duration of Symptoms

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