

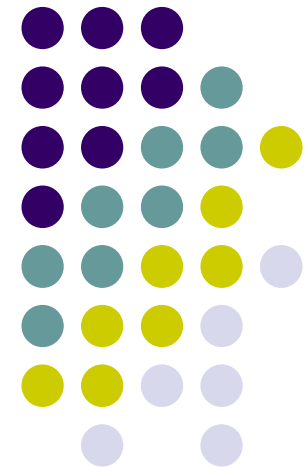
# TIAs

Ajay Kumar

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October, 2009





# Overview

- Stroke Burden
  - Why TIAs are important
- TIAs
- Stroke Secondary Prevention
  - Summary of the evidence
- ABCD2 Score
  - Identifying the high-risk patient
- CMDHB
  - What we are doing and hope to do

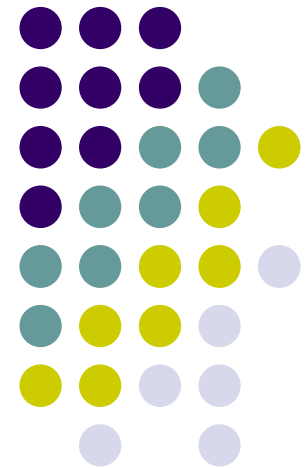


# Stroke Burden

## Why TIAs are important

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Ajay Kumar





# Stroke Burden in NZ

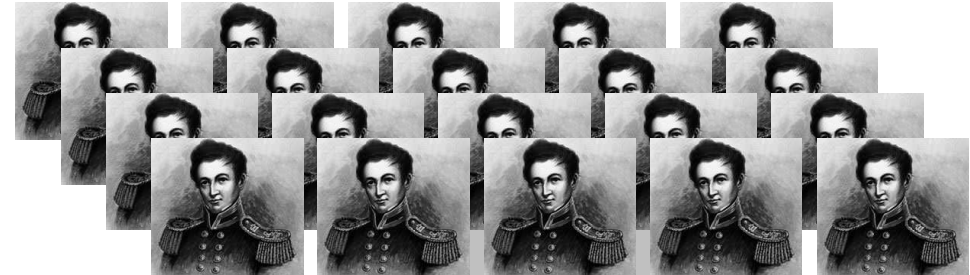
- 1 in 8 New Zealanders will have a stroke
- 3rd leading cause of death in NZ
- Major cause of long term adult disability
- Number of strokes projected to increase

# Stroke in NZ

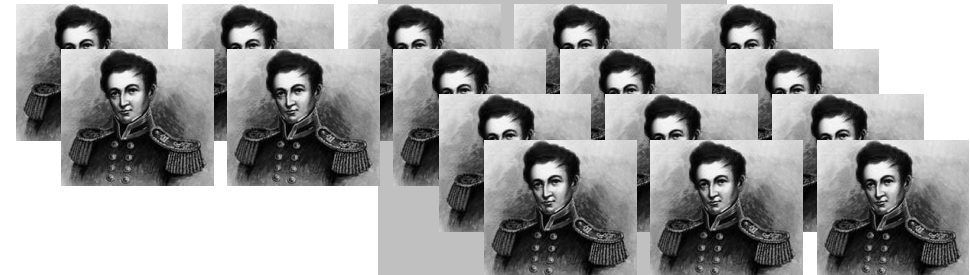


= 5%

**7600**  
**Strokes**  
in NZ every year



**1 Month - 20% die**



**1 Year - 55% die**

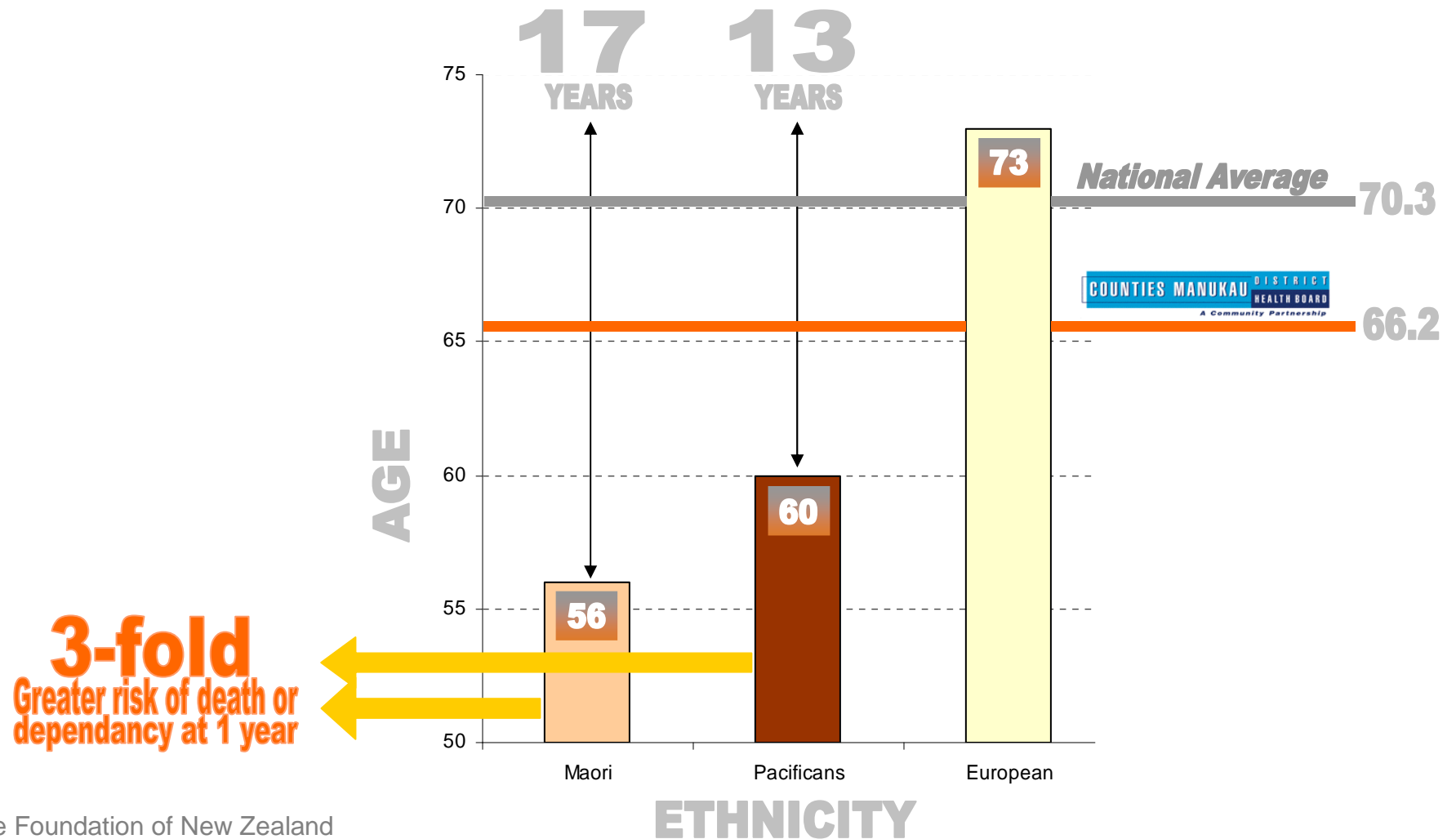


**26%**  
Recurrent Stroke

**74%**  
First Ever Stroke

# Stroke in NZ

## Age of Onset by Ethnicity





# Economic Burden

**\$NZ 28,000 – 1<sup>st</sup> Year**

Estimated costs for people in the first year admitted to hospital with  
1<sup>st</sup> ever stroke in NZ in 2009

**\$NZ 82,000 – Lifetime Costs**

Lifetime costs for NZ (based on ARCOS summit Nov 2009) =\$NZ 82,000;



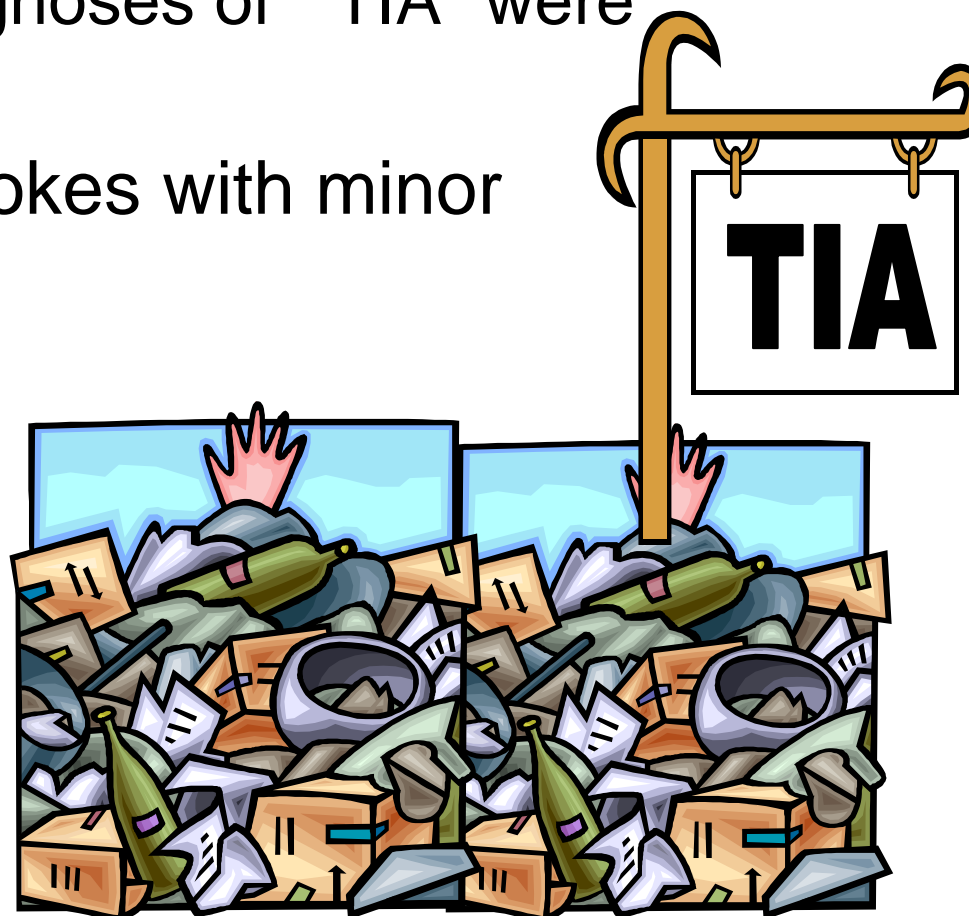
# TIA's are common

- 'How **common?**' is **difficult** because
  - have to rely on patient descriptions
  - 1/4 - 1/2 patients don't seek medical help
  - GP's often don't refer patients
  - experts disagree on whether symptoms due to TIA or not



## “TIA” is a diagnostic dumping ground

- Auckland Hospital Stroke Audit
  - 1/3 of discharge diagnoses of “TIA” were incorrect
  - most had had strokes with minor symptoms/signs

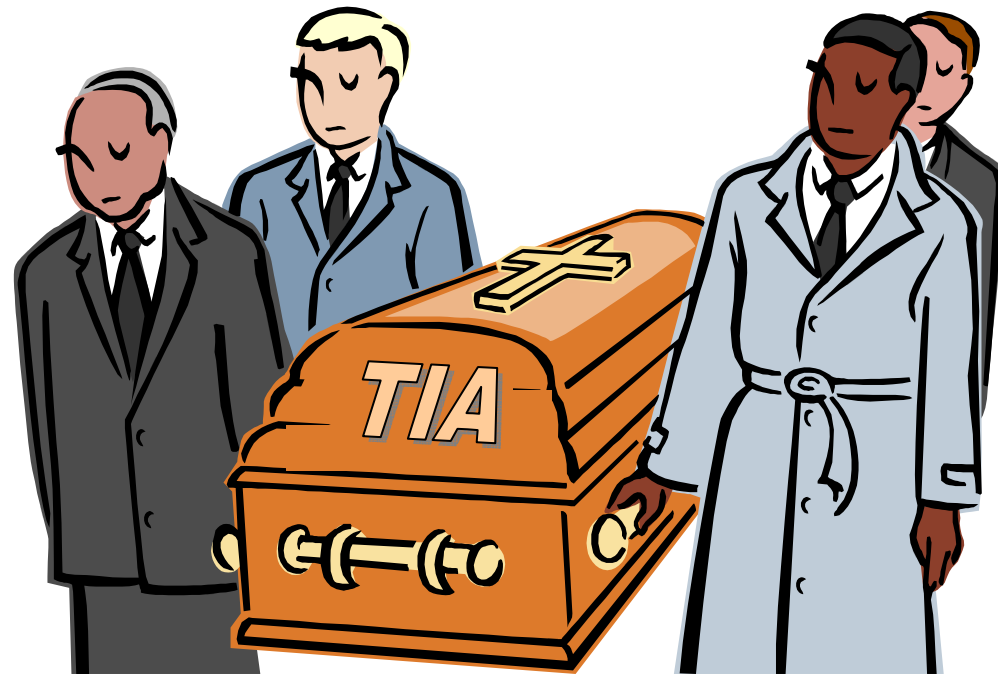


# “TIA” is a diagnostic dumping ground



- Not all chest pain is due to cardiac ischemia
- Not all transient neurologic symptoms are due to cerebral ischemia
- ARIC study – 12 200 people 45-65 yrs followed 3 yrs
  - 47% had transient neurologic symptoms
  - 6% had a TIA

# TIA's carry a poor prognosis





# TIA's carry a poor prognosis

In the 3 months following a TIA

- 25% will have an adverse event
  - 10 % have a stroke
    - 1/2 within the next 2 days
  - 12 % have another TIA
  - 2.5 % hospitalised with cardiac problems
  - 2.6 % die

# TIA's carry a poor prognosis

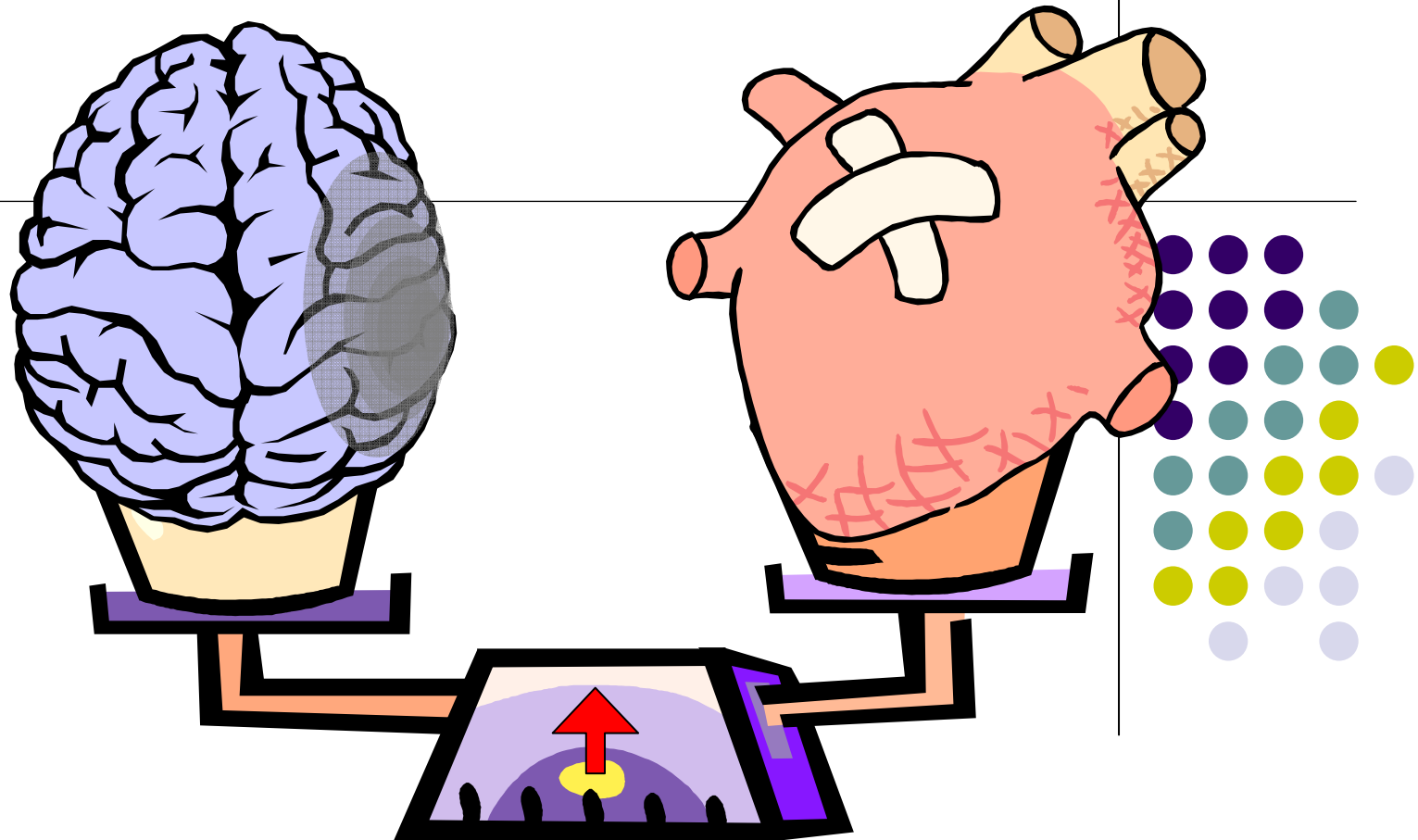


- Oxford population based study of TIA the risk of stroke was
  - 8% at 7 days
  - 12% at 30 days
  - 17% at 90 days<sup>1</sup>
- Alberta wide ICD based study of TIA
  - 22% risk of stroke, MI or death at 1 yr<sup>2</sup>

1. BMJ 2004;328:326

2. Neurology 2004;62:2015

# TIA vs Unstable Angina





# TIA vs Unstable angina

- Prognosis of further vascular events or death are in the same ballpark
- Why then are **TIA's not taken as seriously** as unstable angina?
  - Symptoms usually resolved when seen
  - TIA's don't cause pain
  - In the past little could be done for a TIA
  - Patients often older
  - Lacking awareness



## TIA's need to be taken seriously

- Prognosis for stroke/death is higher than previously thought
- Adverse event risk varies depending on patient and TIA type

**TIA should be seen as an opportunity to prevent stroke/vascular death in a high risk group**





# Risk of stroke/death after TIA

- Significantly underestimated in the past
- TIA and stroke are on a continuum of risk

**PREVENTION**

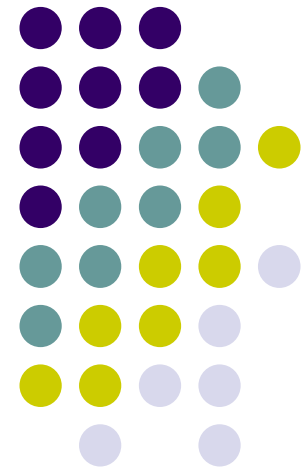


# Secondary Prevention

## The Evidence

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Edward Wong





# Vascular Risk Factors

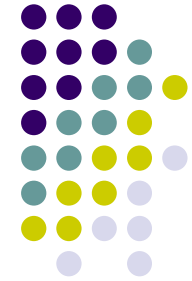
- **Modifiable**

- Hypertension
- DM
- Dyslipidaemia
- Atrial Fibrillation
- Smoking
- ↑ Alcohol
- ↑ Weight
- ↓ Physical exercise

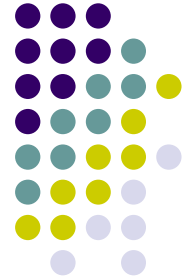
- **Non-Modifiable**

- FHx
- Age
- Hx IHD
- Gender

# Hypertension



- Antihypertensive treatment is recommended for prevention of stroke, recurrent TIA and other vascular events in persons who have had a TIA and are beyond the hyperacute period (IA)
- Benefit present in persons with and without a history of hypertension, so should be considered as secondary prevention for all (IIB)

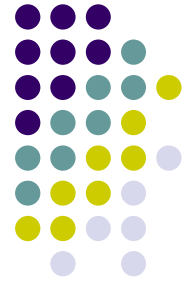


# Hypertension

- Lifestyle modifications in reducing BP should be recommended (IIB)
- Available data supports use of a combination of a thiazide diuretic and an ACE inhibitor (IA)
- However, ideal drug regimen is unknown and ought to be individualized

# Hypertension

- ↓DBP 5 mmHg → ↓stroke risk by ~1/3
- ↓SBP 10 mmHg → ↓stroke risk by ~1/3



# Diabetes



- Tighter blood pressure and lipid control recommended (IIaB)
- Aim to keep blood glucose levels normoglycaemic (IA), and HbA1C <7% (Class IIaB)



# Lipid Management

- TIA patients with high cholesterol and comorbid coronary artery disease, or evidence of an atherosclerotic origin should be managed with lifestyle modification, dietary guidelines and medication (IA)
- Statin therapy with intensive lipid-lowering effects is recommended (IB)



# Atrial Fibrillation

- Patients with TIA and persistent or paroxysmal AF should be anticoagulated with warfarin (Class IA)
- Patients unable to take oral anticoagulants should take 325mg/d aspirin (Class IA)

# Smoking



- All healthcare workers should strongly advise every patient with TIA to quit smoking (IC)
- Counseling, nicotine products and medications have been found effective in helping smokers quit (IIaB)



# Alcohol Consumption

- Strong evidence that heavy drinking is a RF for TIA and stroke, through hypertension, hypercoagulable state, reduced cerebral blood flow, and AF
- Light-moderate drinking appears to have a protective effect, possibly related to an elevation in HDL, reduced platelet aggregation and reduced fibrinogen



# Alcohol Consumption

- Heavy drinkers should be advised to stop or reduce alcohol consumption (IA)
- No more than 2 drinks per day for men and 1 drink for women should be considered (IIbC)

# Obesity



- Obesity has been shown as an independent risk factor for CHD, although not directly for stroke
- Several studies suggest abdominal obesity is most directly related to stroke risk
- Weight reduction is recommended for overweight TIA patients (Class IIbC)

# Physical Activity



- At least 30 minutes physical exercise of moderate intensity most days recommended (Class IIbC)



# Antiplatelets

- For all patients with noncardioembolic TIA, antiplatelet agents rather than anticoagulation are recommended (IA)
- Aspirin monotherapy, the combination of aspirin and extended release dipyridamole and clopidogrel monotherapy are all acceptable options (IA)

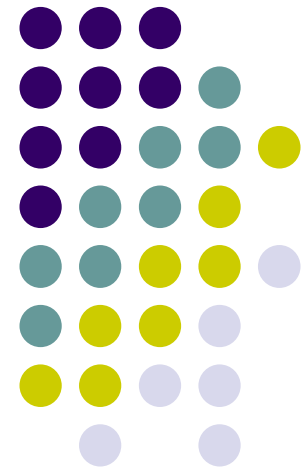


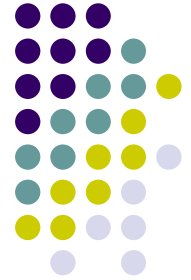
# Carotid Endarterectomy

- TIA within the last 6 months and ipsilateral severe (70-99%) carotid artery stenosis, carotid endarterectomy is recommended by a surgeon with a perioperative morbidity and mortality of <6% (IA)
- For moderate (50-69%) stenosis, CEA is recommended, depending on patient-specific factors such as age, gender, comorbidities, and severity of the initial symptoms (IA)

# ABCD<sup>2</sup> Score

Teddy Wu





# ABCD2 score

- Simple, practical risk stratification score
- Short term risk of stroke
- Dichotomised to low and high risk

From Johnston SC, Rothwell PM et al Lancet 2007; 369:283-92



# Typical symptoms of TIA

- Unilateral weakness face/arm/leg (50%)
- Unilateral altered sensation (35%)
- Dysphasia (18%)
- Monocular blindness (18%)
- Hemianopia (5%)

Frequency reported in Oxford Shire Community Stroke Project (OCSP)

# Atypical symptoms for TIA



- Confusion (exclude dysphasia)
- Impaired Level of Consciousness
- Dizziness or light headed
- Fainting or syncope
- Amnesia
- Generalised weakness or sensory symptoms
- Bilateral blurred vision or scintillating scotoma
- Incontinence bladder or bowel



*To admit or not to admit? That is the question....*

*ABCD2 risk stratification*

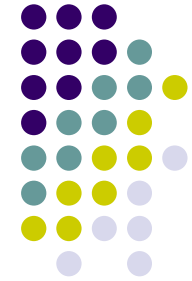


# Components



Assessment		score
<b>A</b> ge	>60	1
<b>B</b> lood Pressure	> 140 SBP and/or DBP 90	1
<b>C</b> linical Features	Unilateral weakness <b>or</b> Speech disturbance and no weakness <b>or</b> Other	2 1 0
<b>D</b> uration of Symptoms	>60minutes 10-59 minutes <10 minutes	2 1 0
<b>D</b> iabetes	Present	1

# ABCD2 score



Score	7 day risk of stroke	90 day risk of stroke
0 – 3	1.2%	3.1%
4 – 5	5.9%	9.8%
6 – 7	11.7%	17.8%

# CMDHB guidelines



Low risk group ( ABCD2  $\leq$  3)

- Start Rx with dual antiplatelet and statin
- Refer for urgent outpatient clinic review

High risk group (ABCD2  $\geq$  4)

- Admission to hospital for inpatient investigations (Neuroimaging and carotid US if carotid circulation)
- All patients with recurrent or crescendo TIAs *need* to be admitted

# EXPRESS TIA Clinic



Rapid access clinic for patients with TIA and/or minor strokes

EXPRESS trial

- Rothwell et al Lancet. 2007 Oct 20;370(9596):1432-42
- Phase 1 vs Phase 2
- Traditional OP referral vs Walk in acute TIA clinic
- n= 323 vs n=297
- Outcomes measures – Recurrent stroke at 90 days, effect on time to review and Rx.

# Results



Outcome	Phase 1	Phase 2
Median delay to R/V (Days)	3	<1 (p<0.0001)
Median time to Prescriptn	20	1 (p<0.0001)
90day risk of recurrent stroke 0.49; p=0.0001)	10.3%	2.1% (HR 0.20, 95% CI 0.08-

# Interpretation

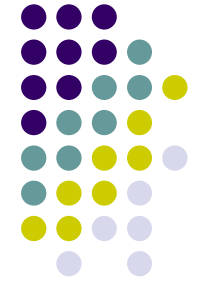


80% reduction in short term risk of stroke

Benefit independent of age and gender.

Early Rx did not increase risk of ICH or other bleeding.

# At CMDHB



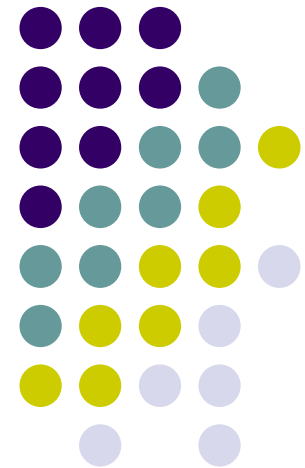
High risk patients should be admitted.

Low risk patients referred to acute TIA / Stroke clinic at Botany / MSC through triage process

# ... and at CMDHB

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Kris Vette  
Edward Wong





*Are there still symptoms or sign?*



*Are there still symptoms or sign?*

Yes?

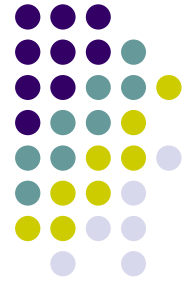


*Are there still symptoms or sign?*

**Yes?**

**Treat as a stroke, until proven otherwise**

# Identify high-risk patients



- Crescendo TIAs
  - 2 or more TIAs in a week
- Known carotid stenosis ipsilateral to symptomatic hemisphere
- AF
- High ABCD<sup>2</sup> score ( $\geq 4$ )

# High Risk TIA Patient

**Admit to General Medicine**

**Start Aspirin**



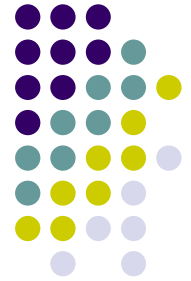
# High Risk TIA Patient



**Admit General Medicine**  
**Start Aspirin**

# Low Risk TIA Patient

- All the others





# Low Risk TIA Patient

- Lifestyle changes to address risk factors
  - Especially smoking
- Check ECG, bloods (including fasting glucose, lipids studies, CBC, ESR/CRP)
- Start/Add
  - Aspirin 300 mg stat and then 100 mg od
  - Dipyridamole SR 150 mg bid
  - Simvastatin 20-40 mg od
  - Blood-pressure lowering treatment
    - Target? <130/80?

# Low Risk TIA Patient

- Advise against driving
- Refer to Stroke/TIA Clinic



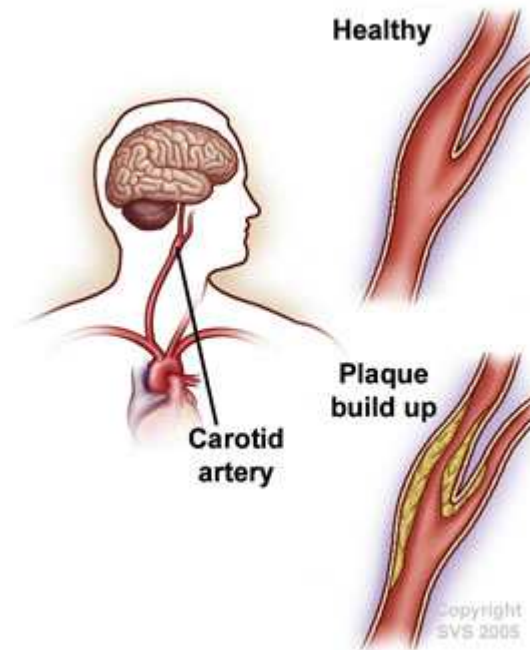


# TIA

## Integrated Care Pathway Development

An Inter-Disciplinary  
Approach  
at  
Counties Manukau DHB

Kris Vette – Quality Improvement Unit  
OPJ Project  
Initially Looking at Radiology Access





# IS IT A STROKE?

Dial 111 if someone can't:



**F**

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



**A**

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



**S**

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



**T**

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

Time ....  
the scarcest resource in this pathway



# TIA's and Strokes aren't Sexy

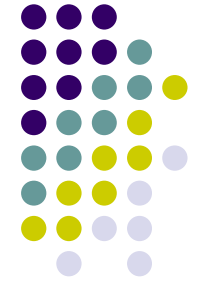


Some strokes still can get triaged as T5

Some TIA's don't get treated

But TIA is to Stroke what Chest Pain is to ACS

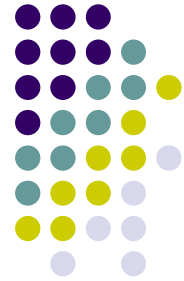
# TIA's Aren't Sexy



.....but we need to Bring Sexy Back!

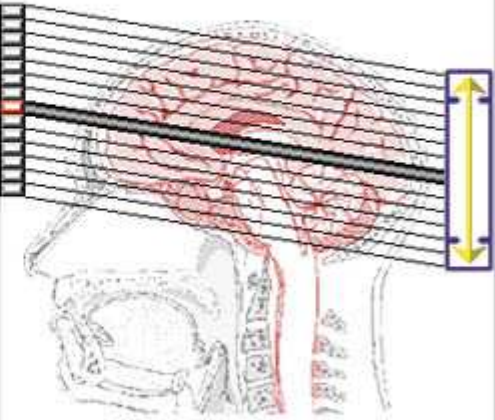



# Access to Imaging – CT Head and Carotid Ultrasound is important



Case 1: 70-year old woman  
Scan acquired 2hr 15min after stroke onset.

Slide 7



Selected Slices

Patient Notes   Paresis Information   Add to Selection   Make Therapy Decision

Help NEXT: Select up to four slices, then click Make Therapy Decision to proceed

The image shows a software interface for reviewing CT scans. On the left, a large axial CT scan of the head is displayed, labeled 'Slide 7'. On the right, a 'Selected Slices' panel shows a 3D reconstruction of the head with a series of horizontal lines representing the CT slices. A yellow double-headed arrow indicates the range of slices selected. Below the main image area, there are four buttons: 'Patient Notes', 'Paresis Information', 'Add to Selection', and 'Make Therapy Decision'. At the bottom, a 'Help' button is followed by the instruction: 'NEXT: Select up to four slices, then click Make Therapy Decision to proceed'.

Predicting the Future c 80% accuracy

‘Taking a peak over the event horizon’

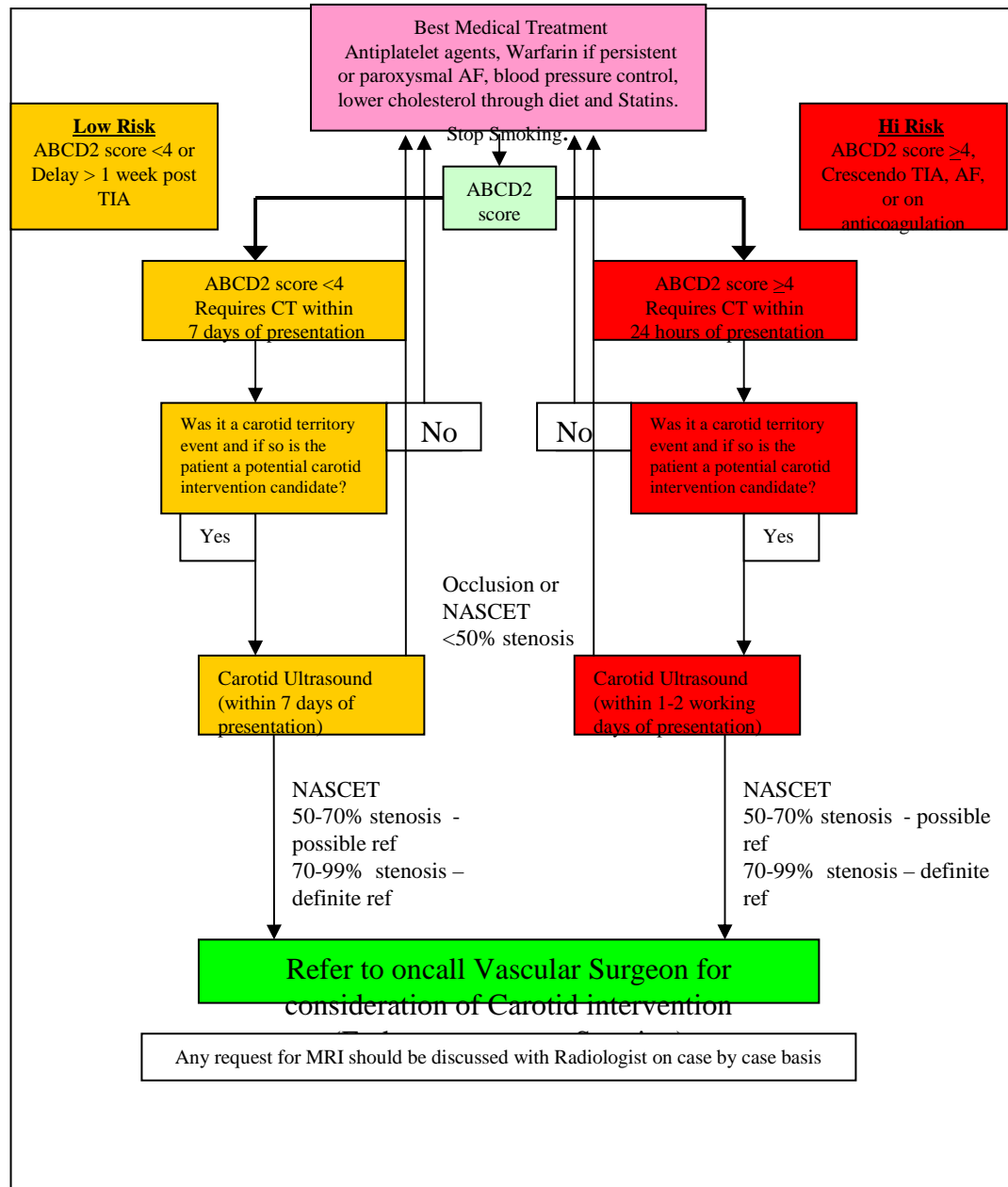


## ABCD2 scoring

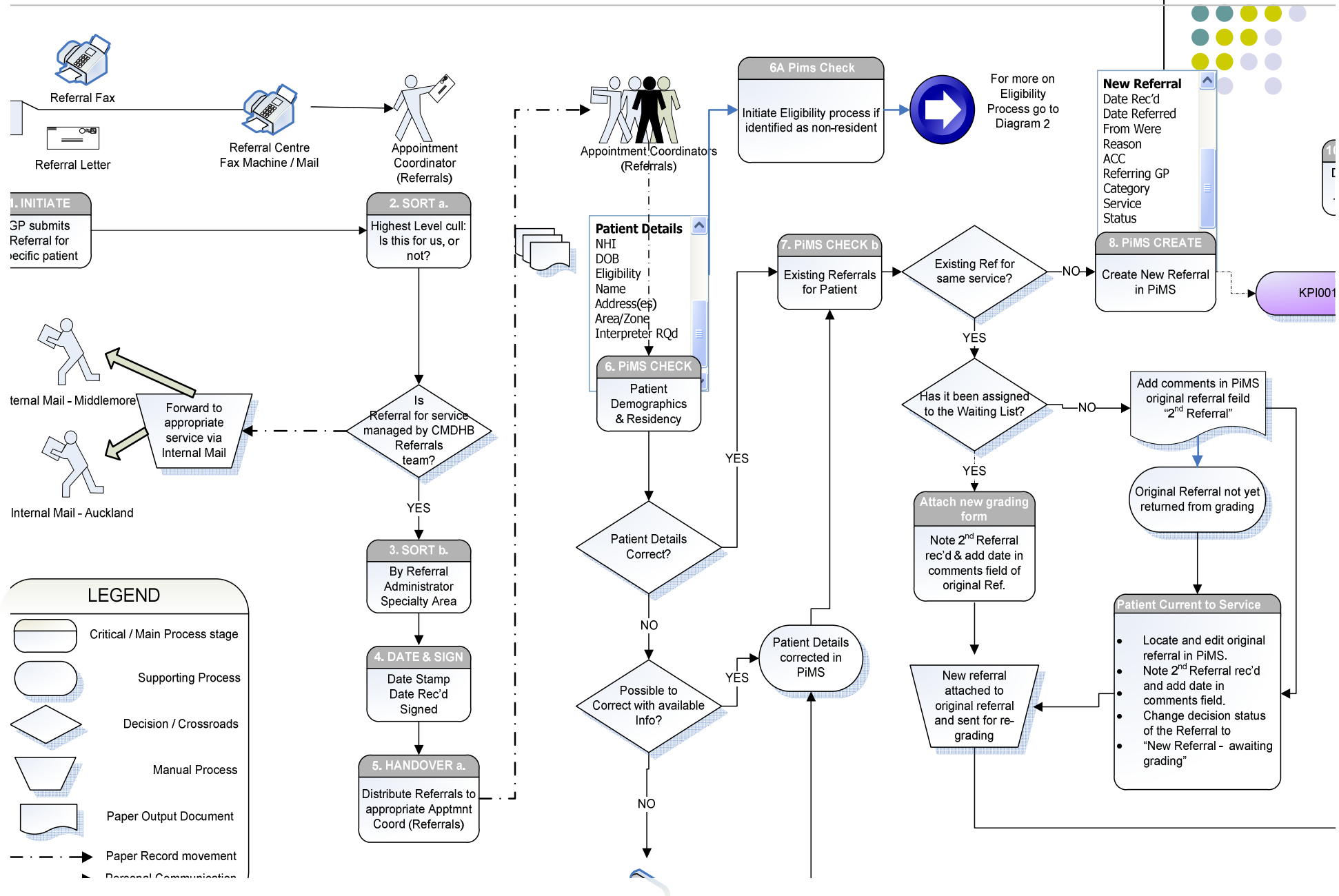
12% of High Risk (6-7) will stroke in 24 hrs

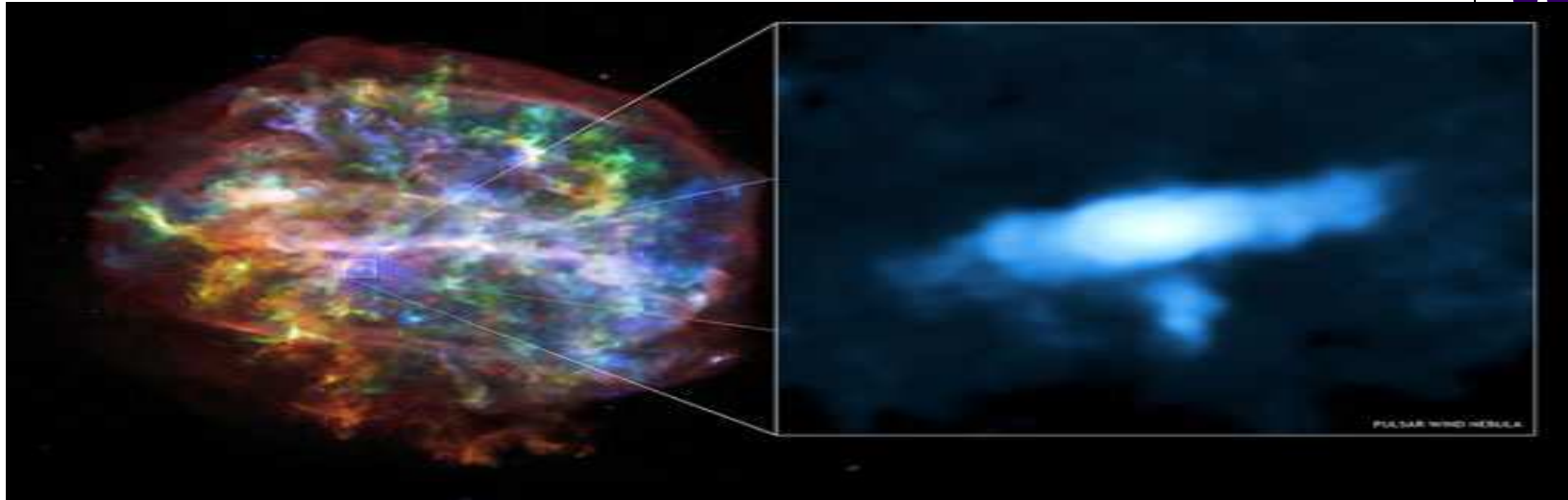
18% of High Risk will stroke in 90 days

# Suspected Transient Ischaemic Attack / Minor Stroke



# 1.0 Referral Logging Process

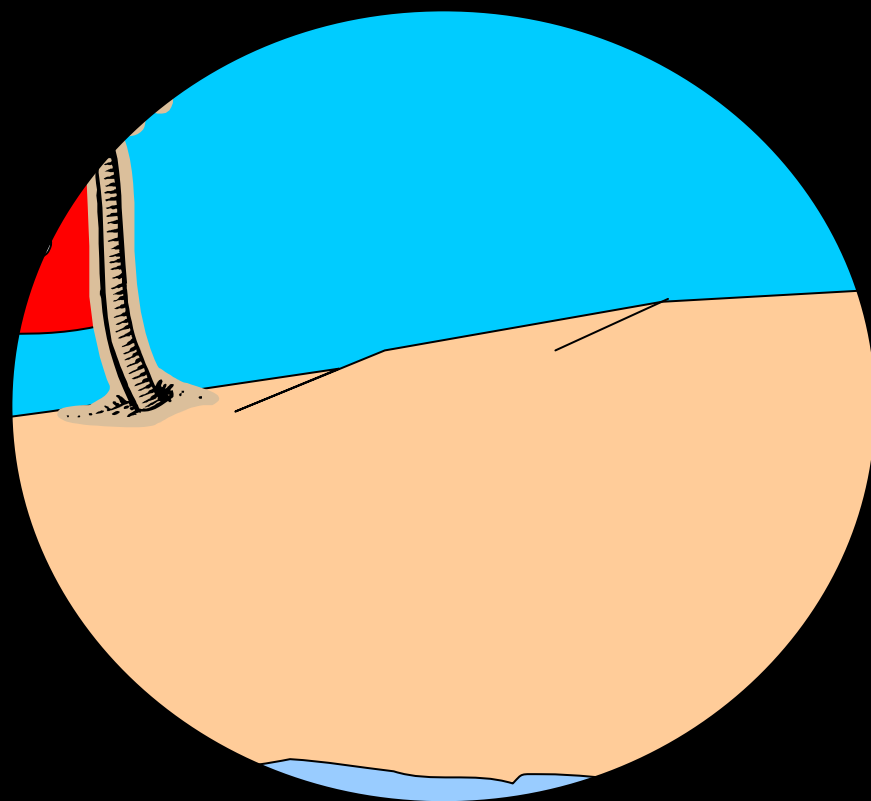


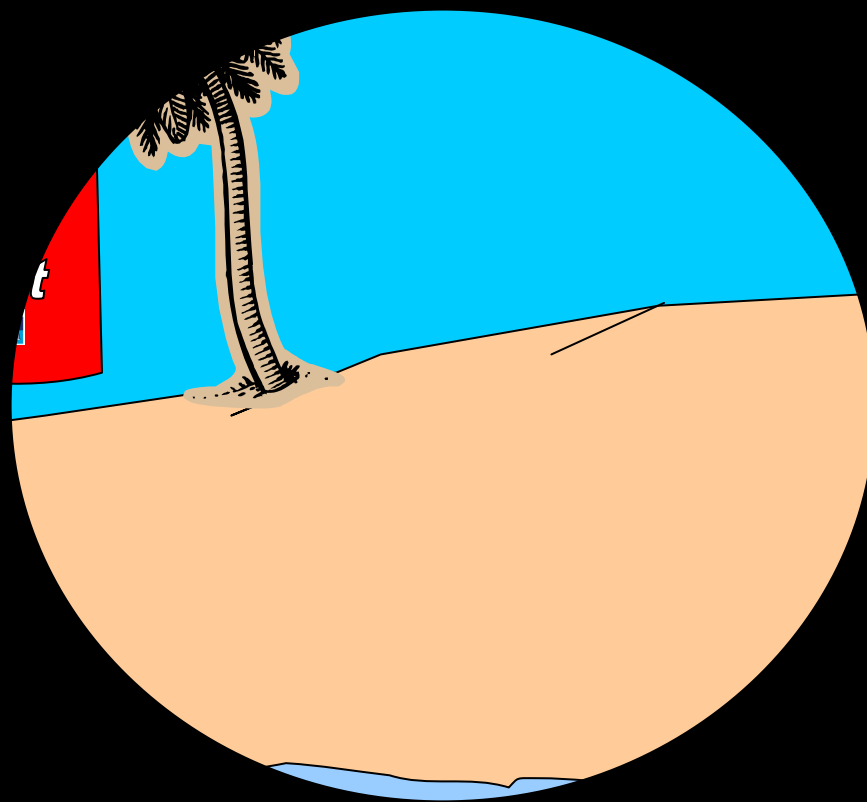


*'And thus the whirligig of time brings  
in his revenges'*

*Twelfth Night*







# Acknowledgements

- Stephen Winters
- Stroke Team
- TIA Team
- AT&R Team
- Northern Stroke Network
- Alan Barber

