Why is Newcastle a good place to have a stroke?

Christopher Levi

Neurologist, John Hunter Hospital, Newcastle & Liverpool Hospital, Sydney
Executive Director, Sydney Partnership for Health Education Research & Enterprise

Delivery Through Partnerships

Researchers
MRIs, universities and healthcare providers

Health Professionals
Hospitals, clinics and other settings

The Community
Governments, businesses, philanthropy and consumers

A Healthy and Wealthy Australia with the World's Best Health System

'Better Health Through Research'

A powerful and enduring Hunter partnership was forged on February 28th 1988 – at 4.15pm

- Near the “Gully Line”

Stockland
'yes'

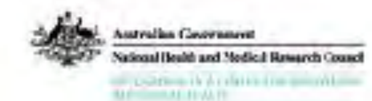
Urbenville
Tenterfield
Moree
Warialda
Emmaville
Inverell
Glen Innes
Bingara
Tingha
Wee Waa
Guyra
Narrabri
Barraba
Armidale
Boggabri
Manilla
Tamworth
Walcha
Gunnedah
Werris Creek
Quirindi
Murrurundi / Wilson
Wingham
Taree / Manning
Scone
Merriwa
Muswellbrook
Gloucester
Dungog
Denman
Singleton
Bulahdelah
Maitland
Kurri Kurri
Nelson Bay
Cessnock
Newcastle Mater
Belmont
John Hunter

GOVERNANCE

GOVERNING BOARD | Centre for Innovation in Regional Health

Members: Chief Executives of the Healthcare partners, Vice Chancellors of the Universities and Executive Director of the Hunter Medical Research Institute

PRIORITY SETTING



TRANSLATION

ISSUE IDENTIFICATION → SOLUTION DEVELOPMENT → SOLUTION IMPLEMENTATION → ANALYSIS AND EVALUATION → SCALE UP AND ROLL-OUT

Its never good to have a stroke!
Know your risk factors and PREVENT

BUT –

Why does Newcastle provide (arguably) the best stroke service in Australia?

The second P to Partnership - People!

The 3rd P = Performance

Leadership

Excellent Clinical Outcomes

High Staff & Patient satisfaction

Self-improving Health Care System

Research

Teaching

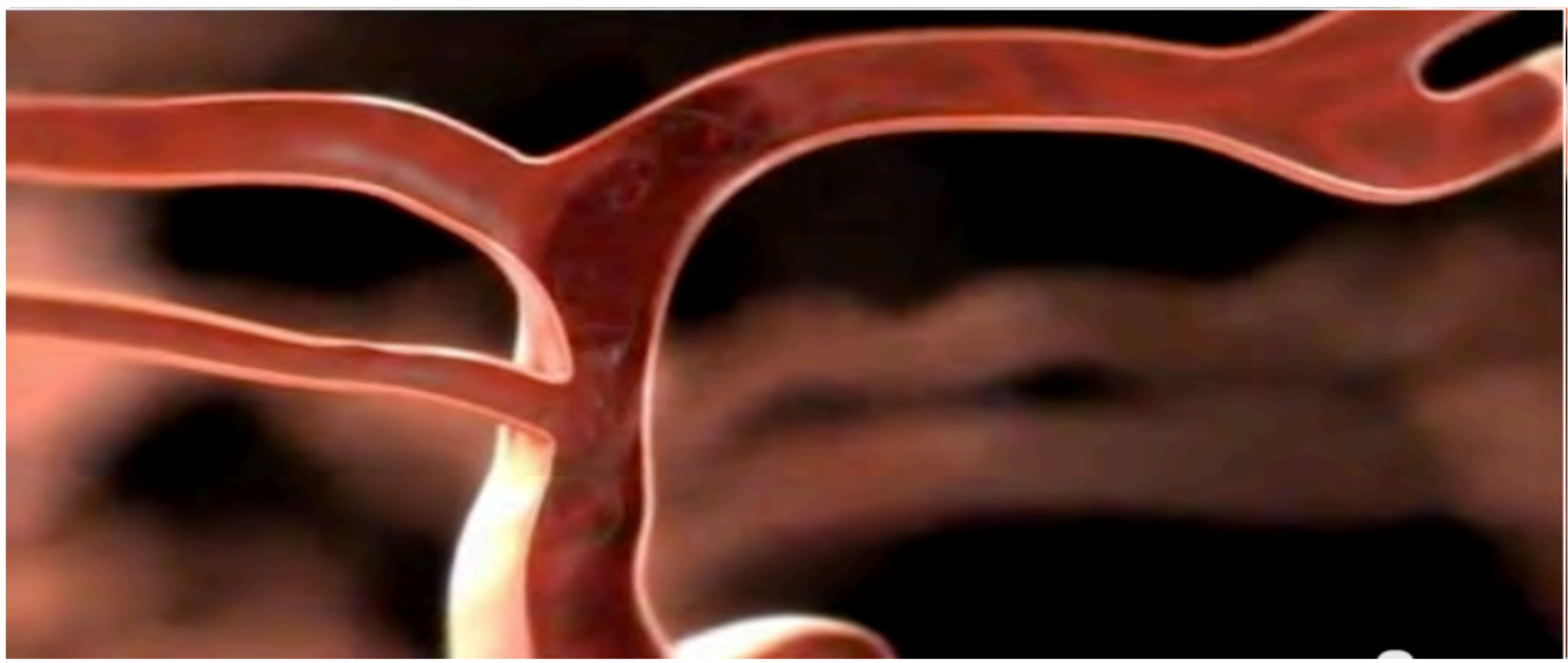
Clinical Academics

Clinical Academics

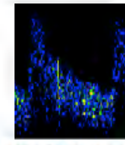
Strong Clinical Service Platform

Mentors and Role Models

A very serious plumbing problem

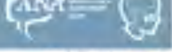


Issues Subject More Content Submit Purchase About



Transcranial Doppler detected cerebral microembolism following carotid endarterectomy. High microembolic signal loads predict postoperative cerebral ischaemia.

Article Contents



Brief Communication

Dextran reduces embolic signals after carotid endarterectomy

Christopher R. Levi MBBS, FRACP, Jacinda L. Stork BA, BAppSci (Hons), Brian R. Chambers MD, FRACP, Anne L. Abbott MBBS, FRACP, Heather M. Cameron RN, Anna Peeters BSc (Hons) PhD, John P. Royle FRACS, FACS, Andrew K. Roberts FRACS, FACS, Gary Fell MBBS, FRACS, Michael C. Hoare MBBS, FRACS, Anthony T. W. Chan Mmed (Surg), FRACS, Geoffrey A. Donnan MD, FRACP

First published: 8 October 2001

DOI: 10.1002/ana.1233

Benefits of stroke unit care

↓ odds of death	0.86 (0.71-0.94)
↓ odds of death/institution	0.80 (0.71-0.90)
↓ odds of death/dependency	0.78 (0.68-0.90)

NNT to avoid 1 death = **33**

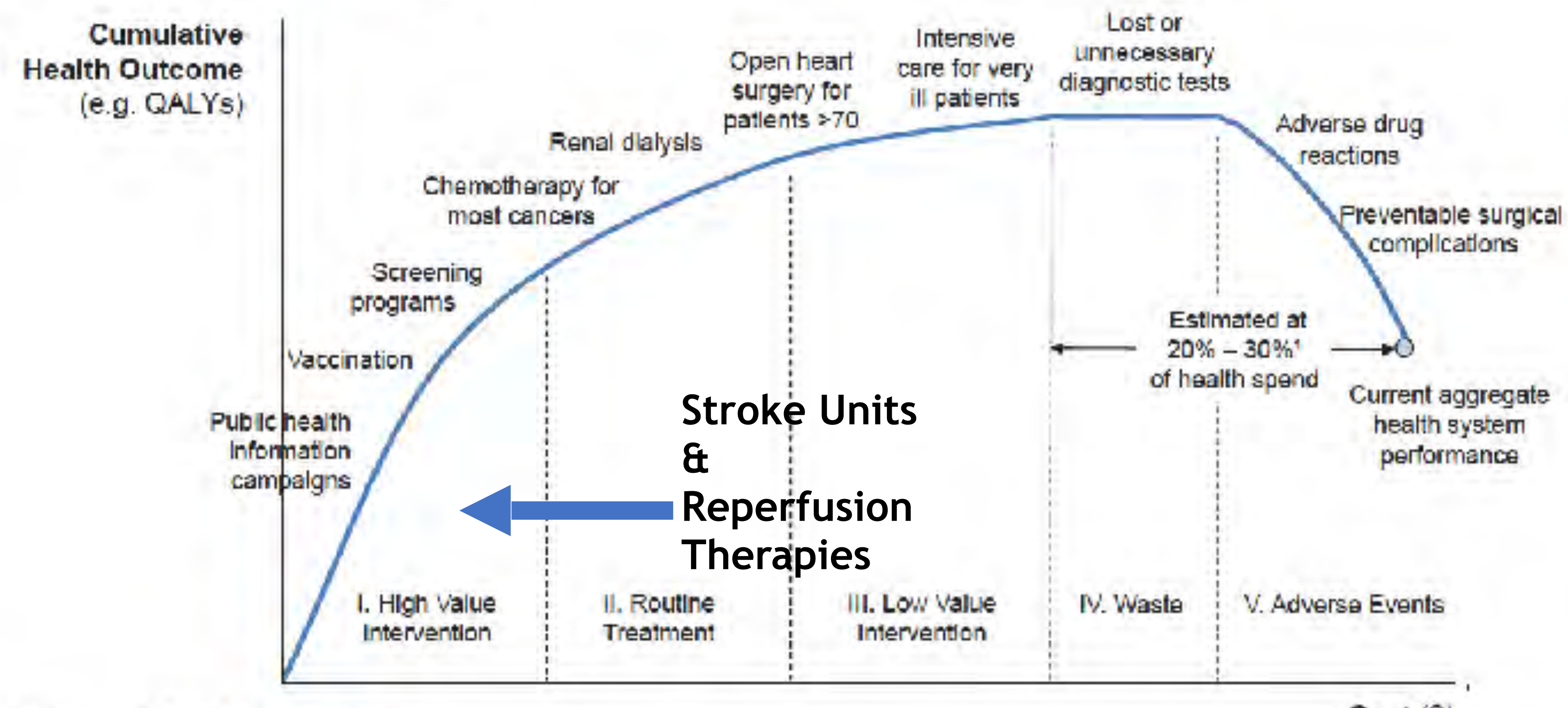
NNT to avoid 1 dependent = **20**

Benefits for all ages, severities, both sexes

Stroke Unit Trialists' collaboration, 23 trials, 4,911 patients (Cochrane review 1997)

Health outcomes are driven by productivity and cost-effectiveness of interventions

Health System Performance



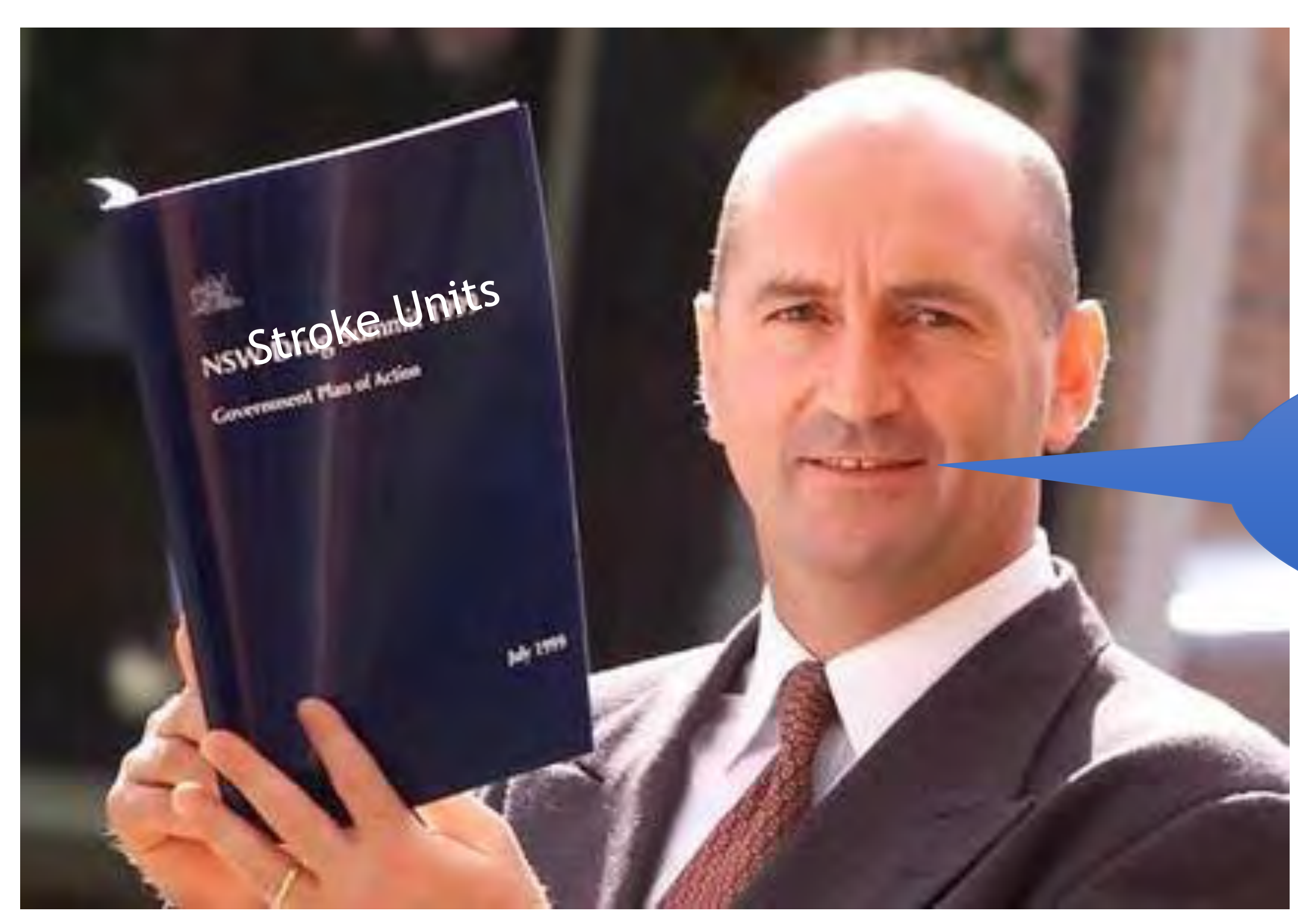
Notes: 1. Based on US estimates

Source: Pacific Strategy Partners analysis; TO Tengs, et al, 'Five-hundred life saving interventions and their cost effectiveness', *Risk Analysis*, 1995, 15(3):369–484; Institute of Medicine of the National Academies, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*, 2012; DM Berwick & AD Hackbarth, 'Eliminating Waste in US Health Care', *Journal of the American Medical Association*, 2012, 307(14):1513-1516; Pricewaterhouse Coopers (PWC) Health Research Institute, *The Price of Excess: Identifying Waste in Healthcare Spending*, 2008

McKeon Review 2013

BUT in Newcastle – not all "doom and gloom" – very solid clinical service platform, strong leadership, talent, good will and support for people with drive and initiative

And - Good fortune on the horizon



Reform via end-user engagement, incentives, measurement and performance monitoring

NSW Government amazingly *ACTED ON* recommendations that came “undiluted” from a truly clinician-led “taskforce” GMTT-GMCT

(now ACI – bureaucratized and stale – lost its mojo)

NSW Stroke Reformation

- **Pre Reform (pre-2002)**
  - **7 hospitals with a quasi SU's (35%)**
  - **3 hospitals with a "mobile stroke team" (15%)**
- **ASU establishment period**
- **Post Reform (post-2004)**
  - **19 Acute Stroke Units**
    - **minimum 4 beds (100%)**
    - **4 on-call Drs (79%)**
  - **1 rehabilitation Stroke Unit**
  - **1 hospital indirectly supported through GMTT**

One of a number of mistakes in retrospect !!

Improvements in the quality of care and health outcomes with new stroke care units following implementation of a clinician-led, health system redesign programme in New South Wales, Australia

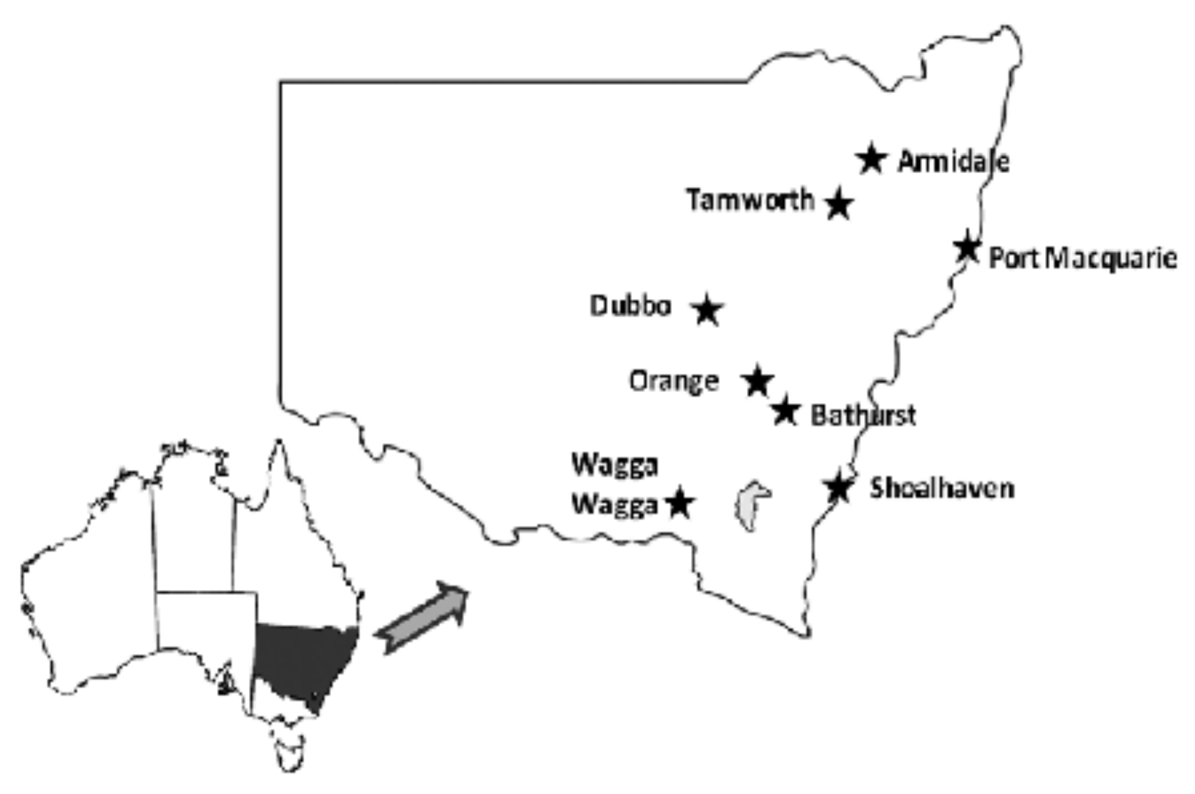
Qual Saf Health Care 2008;**17**:329–333.

Figure 1 New South Wales stroke programme boundaries. Reprinted with permission from NSW Health, Australia.

Evaluation of Rural Stroke Services

Does Implementation of Coordinators and Pathways Improve Care in Rural Hospitals?

Stroke. 2013;44:2848-2853



Implementation Science

Study protocol

Open Access

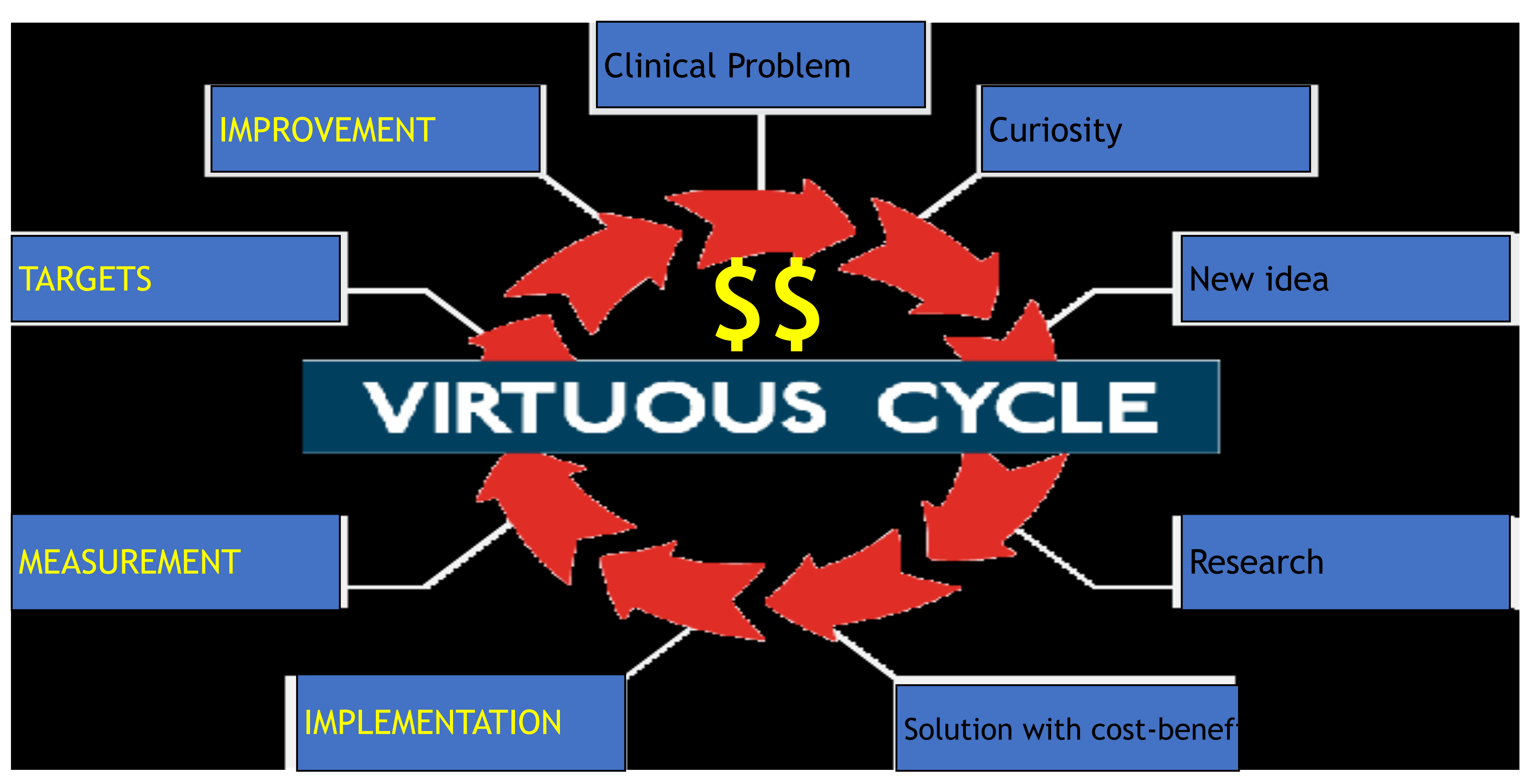
Fever, hyperglycaemia and swallowing dysfunction management in acute stroke: A cluster randomised controlled trial of knowledge transfer

Sandy Middleton*[1], Christopher Levi[2], Jeanette Ward[3], Jeremy Grimshaw[4], Rhonda Griffiths[5], Catherine D'Este[6], Simeon Dale[7], N Wah Cheung[8], Clare Quinn[9], Malcolm Evans[10] and Dominique Cadilhac[11]

Implementation of evidence-based treatment protocols to manage fever, hyperglycaemia, and swallowing dysfunction in acute stroke (QASC): a cluster randomised controlled trial

Sandy Middleton, Patrick McElduff, Jeanette Ward, Jeremy M Grimshaw, Simeon Dale, Catherine D'Este, Peta Drury, Rhonda Griffiths, N Wah Cheung, Clare Quinn, Malcolm Evans, Dominique Cadilhac, Christopher Levi, on behalf of the QASC Trialists Group

www.thelancet.com **Published online October 12, 2011**


Clinical Problem
IMPROVEMENT
Curiosity
TARGETS
$$
New idea
VIRTUOUS CYCLE
MEASUREMENT
Research
IMPLEMENTATION
Solution with cost-benef

Stroke Units

Improvements in the quality of care and health outcomes with new stroke care units following implementation of a clinician-led, health system redesign programme in New South Wales, Australia

D A Cadilhac,[1,2] D C Pearce,[1] C R Levi,[3] G A Donnan,[1,2,4] on behalf of the Greater Metropolitan Clinical Taskforce and New South Wales Stroke Services Coordinating Committee

Implementation of evidence-based treatment protocols to manage fever, hyperglycaemia, and swallowing dysfunction in acute stroke (QASC): a cluster randomised controlled trial

Improving access to acute stroke therapies: a controlled trial of organised pre-hospital and emergency care

Debbie A Quain, Mark W Parsons, Alan R Loudfoot, Neil J Spratt, Malcolm K Evans, Michelle L Russell, Angela T Royan, Andrea G Moore, Ferdinand Miteff, Carolyn J Hullick, John Attia, Patrick McElduff and Christopher R Levi

MJA 2008; 189: 429–433

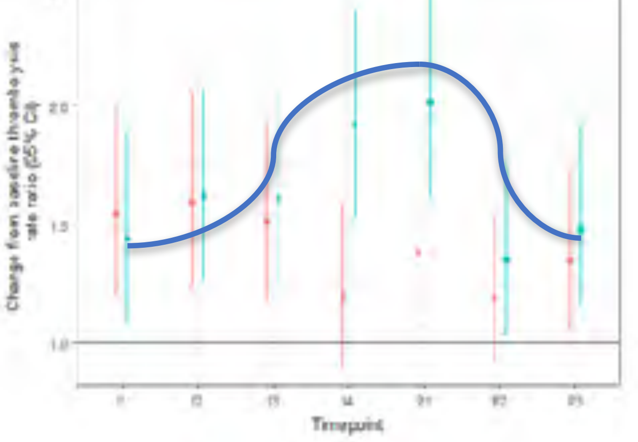
Thrombolysis

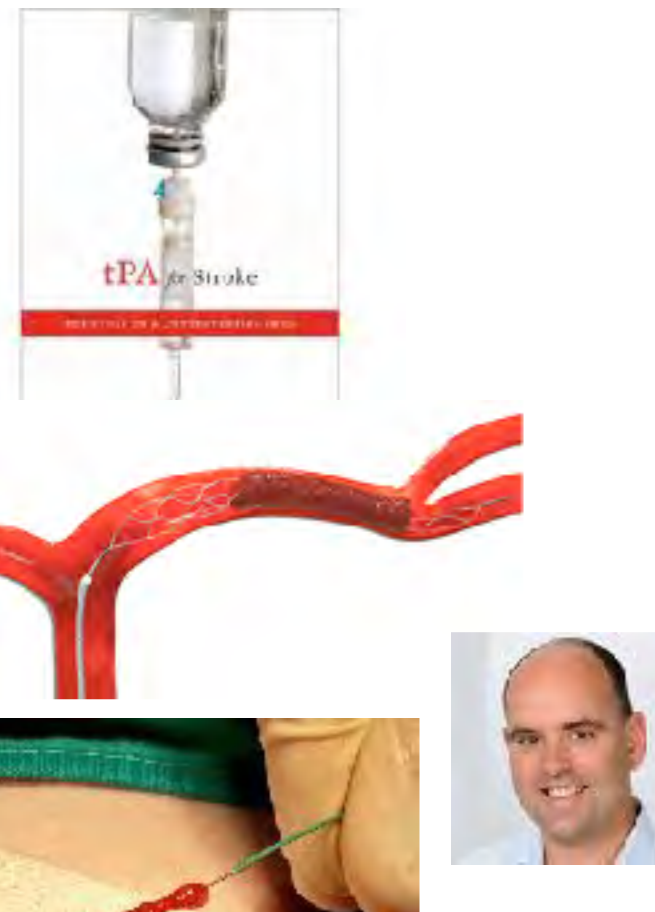
2011	7%
2015	7%

Ischaemic stroke patients receiving clot busting drugs through thrombolysis

43% | 55% | 26%

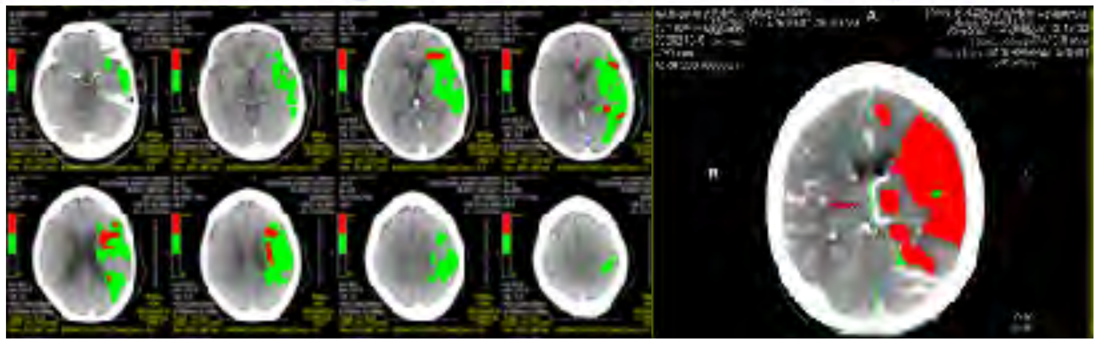
Patients receiving thrombolysis within 60 minutes of hospital arrival





doi:10.1093/brain/awv371 BRAIN 2015: Page

Perfusion computed tomography to assist decision making for stroke thrombolysis

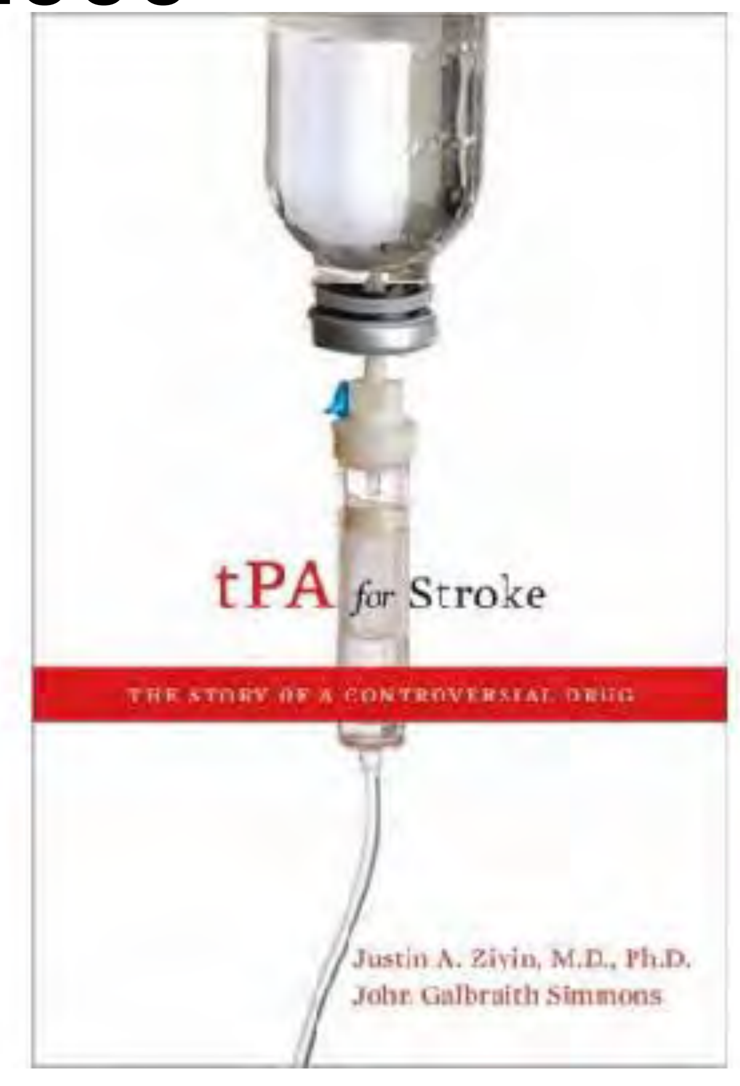


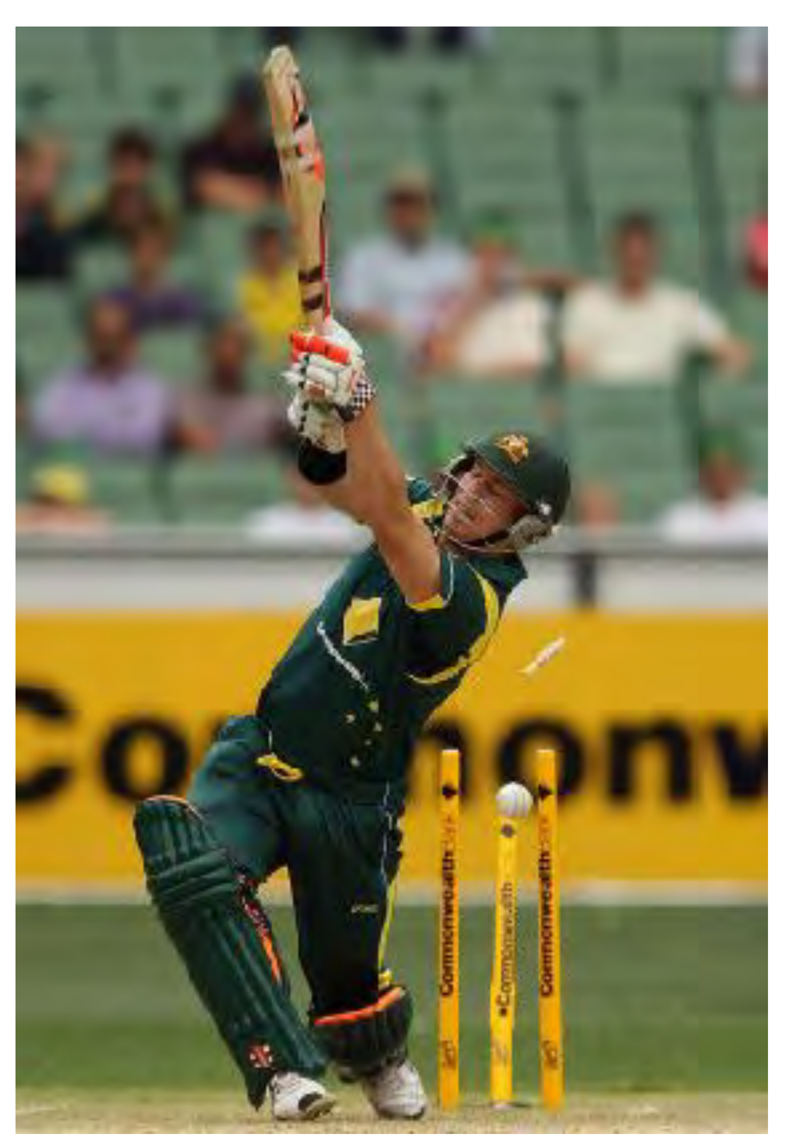
The NEW ENGLAND JOURNAL of MEDICINE

A Randomized Trial of Tenecteplase versus Alteplase for Acute Ischemic Stroke

Mark Parsons, M.D., Neil Spratt, M.D., Andrew Bivard, B.Sc., Bruce Campbell, M.D., Kong Chung, M.D., Ferdinand Miteff, M.D., Bill O'Brien, M.D., Christopher Bladin, M.D., Patrick McElduff, Ph.D., Chris Allen, M.D., Grant Bateman, M.D., Geoffrey Donnan, M.D., Stephen Davis, M.D., and Christopher Levi, M.D.

Reperfusion therapy access in the Hunter pre-2000





1 Pre-hospital Acute Stroke Triage (PAST) protocol

KEY PARTNERSHIP

HUNTER NEW ENGLAND
NSW HEALTH

Pre hospital Acute Stroke Triage: Assessment Tool

TIME OF SYMPTOM ONSET MUST BE LESS THAN 2 HOURS

Patient Surname: Case No: Date

Time of patient assessment :

	YES	NO	UNSURE
Time of onset of symptoms: _______ (less than 2 hours) **If the patient wakes with a deficit or cannot talk, then the time is taken from the last time the patient was seen without deficit.**	☐	☐	☐
Glucose:			
Is the patients BSL inside of the normal range 4mmol-17mmol Recorded BSL _____mmol/l @ _____hours.	☐	☐	☐
Arm: *Lift the patient's arms both outstretched at 90° to trunk.* *Ask the patient to hold them in that position for 5 seconds.*			
Does one arm drift down or fall rapidly	☐	☐	☐
Is handgrip weak on the same side?	☐	☐	☐
Is the loss of power noted on the	**LEFT** ☐		**RIGHT** ☐
Speech: Attempt to have the patient say " You can't teach an old dog new tricks". Ask a relative or friend if speech appears normal Ascertain if speech is slurred or patient has difficulty finding words.			
Is there discernable new speech impairment?	☐	☐	☐

CRITERIA FOR STROKE THROMBOLYSIS

- ✓ *Must be YES to all of the above.*
- ✓ *The symptom onset time is definitely within 2 hours*
- ✓ *Symptoms not improving*
- ✓ *The patient is more than 18 years old*
- ✓ *The patient is normally ambulant* Not previously wheel chair or bed bound
- ✓ *The patient has no history of seizures/epilepsy*

If the patient meets the criteria for **thrombolysis**, follow the **Stroke Intervention Protocol.**

It is vital that every attempt is made to have a relative attend the hospital with the patient unless this will cause a delay in transport.

Improving access to acute stroke therapies: a controlled trial of organised pre-hospital and emergency care

Debbie A Quain, Mark W Parsons, Allan R Loudfoot, Neil J Spratt, Malcolm K Evans, Michelle L Russell, Angela T Royan, Andrea G Moore, Ferdinand Miteff, CarolynJ Hullick, John Attia, Patrick McElduff and Christopher R Levi

MJA 2008; 189: 429–433

Intervention: PAST protocol, comprising a pre-hospital stroke assessment tool for ambulance officers, an ambulance protocol for hospital bypass for potentially thrombolysis-eligible patients, and pre-hospital notification of the acute stroke team.

Main outcome measures: Proportion of patients who received intravenous tissue plasminogen activator (tPA), process of care time points (symptom onset to ED arrival, ED arrival to tPA treatment, and ED transit time), and clinical outcomes of patients treated with tPA.

Results: The proportion of ischaemic stroke patients treated with tPA increased from 4.7% (pre-intervention) to 21.4% (post-intervention) ($P < 0.001$). Time point outcomes also improved, with a reduction in median times from symptom onset to ED arrival from 150 to 90.5 min ($P = 0.004$) and from ED arrival to stroke unit admission from 361 to 232.5 minutes ($P < 0.001$). Of those treated with tPA, 43% had minimal or no disability at 3 months.

Conclusions: Organised pre-hospital and ED acute stroke care increases patient access to tPA treatment, which is proven to reduce stroke-related disability.

The rural Prehospital Acute Stroke Triage (PAST) trial protocol: a controlled trial for rapid facilitated transport of rural acute stroke patients to a regional stroke centre

Ashley R. Garnett[1], Dianne L. Marsden[1,2], Mark W. Parsons[1,2], Debbie A. Quain[1], Neil J. Spratt[1,2], Allan R. Loudfoot[3], Paul M. Middleton[3], and Christopher R. Levi[1,2*], on behalf of the rural PAST Protocol Steering Group

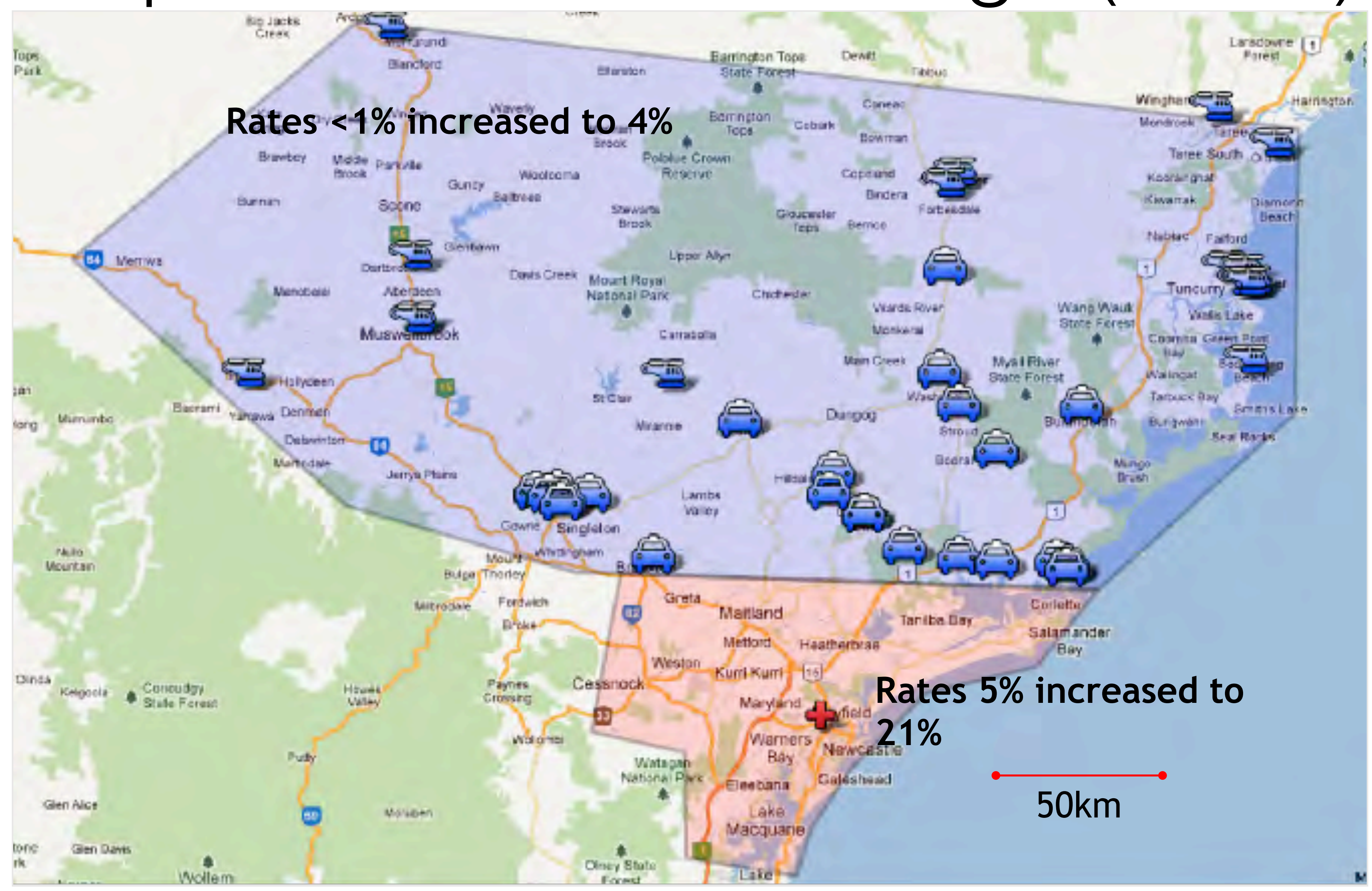
International Journal of Stroke © 2010

Table 1 NIHSS items included in the customised tool: the Hunter NIHSS 8

Hunter NIHSS-8	
NIHSS item	
1a	Level of consciousness (LOC) Rousability
1b	LOC questions
1c	LOC follow commands
2	Best gaze
4	Motor face
5	Motor arm
10	Dysarthria
11	Neglect/extinction

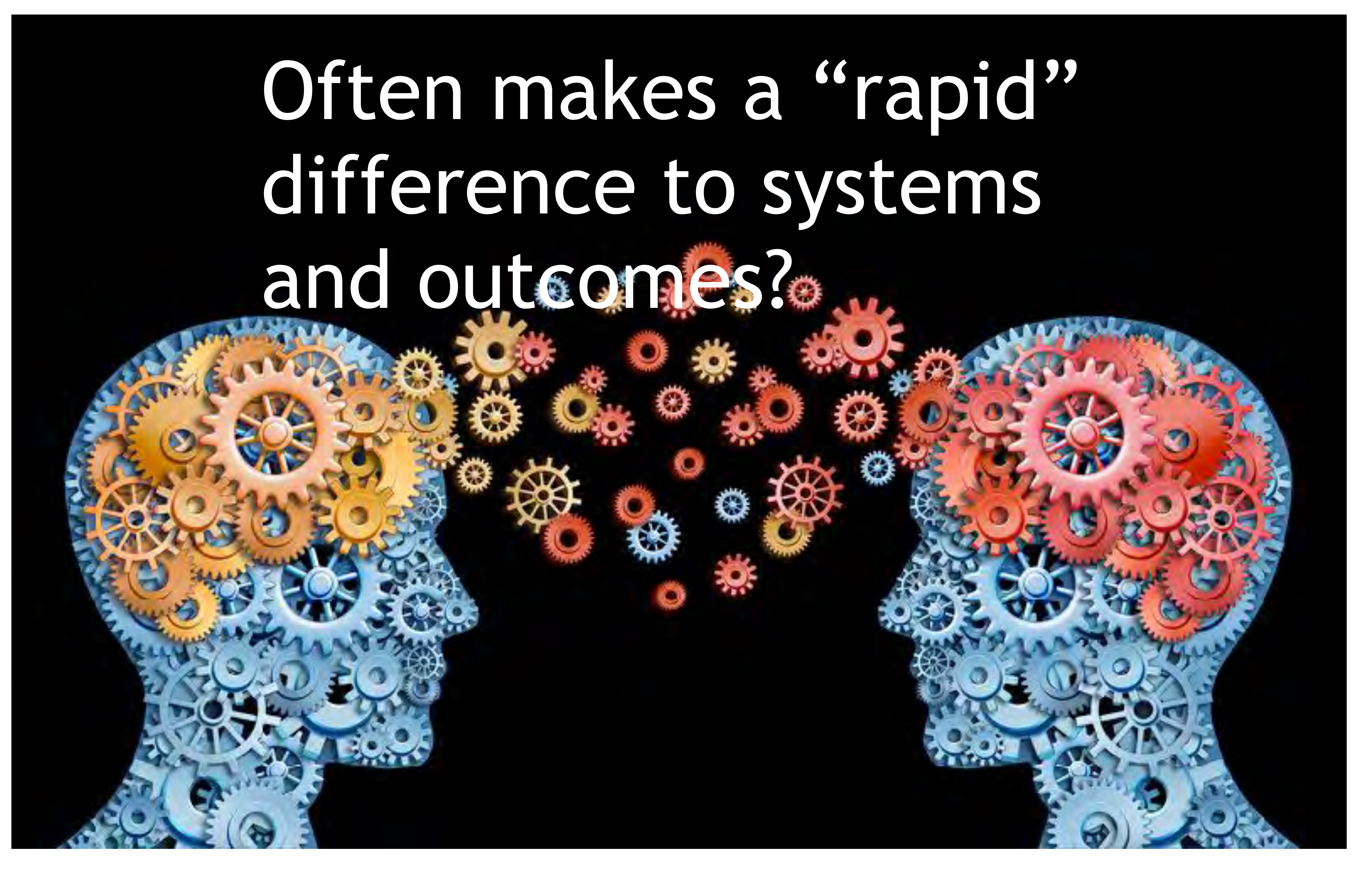
NIHSS, National Institutes of Health Stroke Scale.

Prehospital acute stroke triage (PAST)



PULL RESEARCH – Translational Reserch and Knowledge Translation IN PARTNERSHIP

- SOMEONE WANTS YOU TO DO IT
- CLINICAL NEED – PATIENT END USER ENGAGED
- SYSTEM NEED – MANAGERS ENGAGED
- EVIDENCE PRACTICE GAP for HIGH VALUE CARE OPTION
- LEADERSHIP
- TEAMS
- BUT
    - CHALLENGES
        - HUMAN FACTORS
        - SYSTEMS FACTORS
        - POLICY FACTORS


Often makes a “rapid” difference to systems and outcomes?

So why?

- A strong tradition of working in partnership for mutual benefit – the “one team town”
- Committed and talented leaders
- Engaged community
- A permissive health care and academic environment where people will back a “goer”
- A talent pool that is “parochial” and wants to put “give back” to our region
- Institutions that stand for something and have the backing of the community

Opportunities

- Build research intensive clinical services and a health care led research and research translation “engine” – HNE Research Support and Development Office

- Consolidate and continue to build “local” partnership with UoN that has flourished as the HMRI

- Take the new opportunity to build the NSW Regional Partnership and lead research translation in better health care nationally

WILLIAM AND GLADYS WEASLE'S
WORLD OF TAXIDERMY
There are not too many people in the world right now, Gladys, who can go home at the end of the day happy in the knowledge that everything is completely stuffed.
DOOM AND GLOOM
But stroke care is a bit better than it used to be - I think...
Leunig

Thanks to THE People!

Coke
SHARP