TIA Recognition and Management: Triage, Risk Stratification, and Treatment

Accelerating Primary Care Nov 23, 2014

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Disclosures

- No relevant disclosures

Learning Objectives

Upon completion of this session, participants will be able to:

- Diagnose likely TIA syndromes
- Identify and manage the high risk TIA urgently
- Understand how to access rapid care for TIA

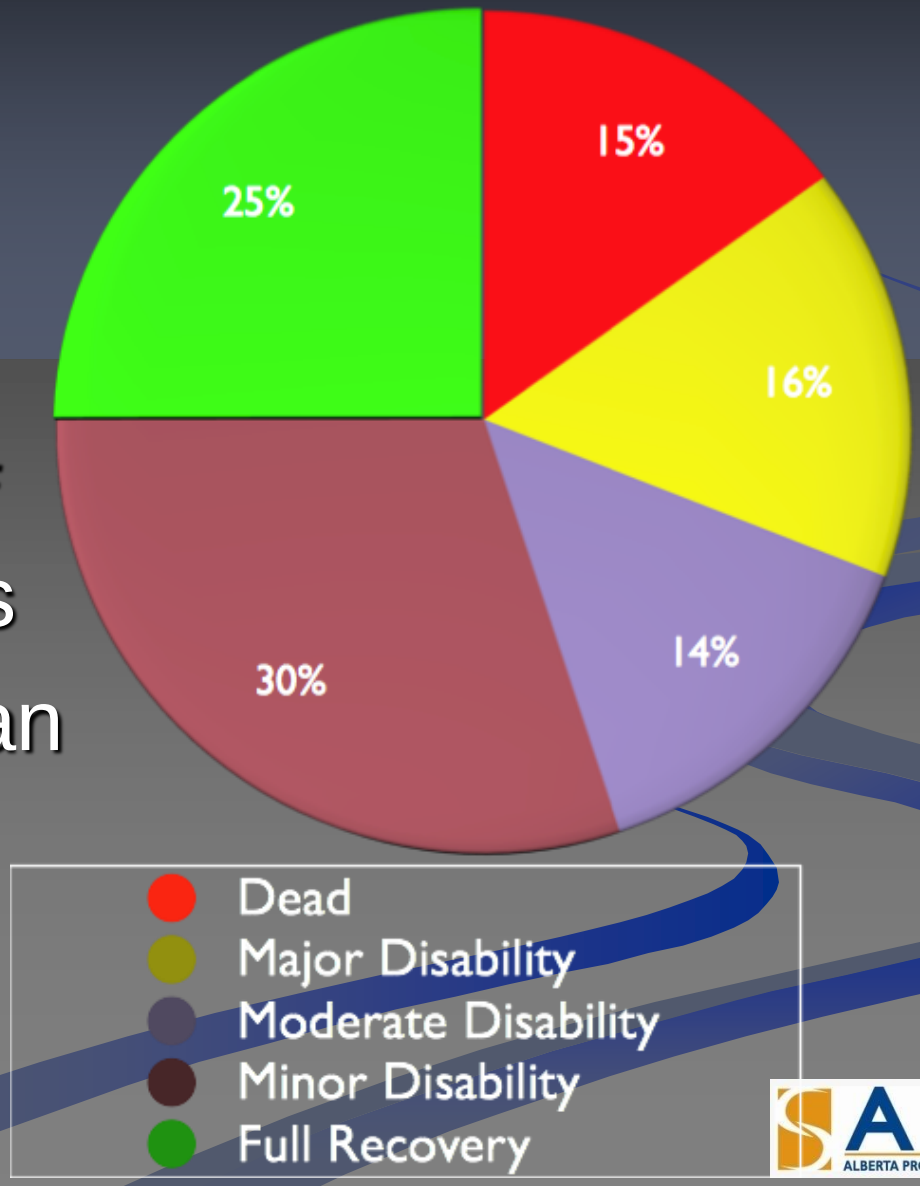
STROKE

- 60 000 strokes per year in Canada
- 5500 strokes per year in Alberta
- Cost Canada 3 billion per year in 1993; 2010 costs:
  - Assuming 3% annual increase in costs 4.5 billion
  - Approximately 400-500 million per year in Alberta

APSS
ALBERTA PROVINCIAL STROKE STRATEGY

The Impact of Stroke

- Fourth leading cause of death in North America
- Leading cause of disability in adults
- Coming soon to an ED or clinic near you!



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Patient 1

- A 54-year old man who has hypertension and hyperlipidemia, smoking, prior MI shows up in your ED; on asa
- No history of stroke or TIA
- A strange event earlier in the day which possibly involved weakness and dysfunction of the left side but patient felt he was ‘not fully aware of his left side and could not walk properly’
- Duration 45 min
- Physical examination shows an average BP of 168/95
- Very anxious

Diagnosing ‘spells’

- Phenomenology: before, during, after the event
- Was the event witnessed? What did witnesses observe?
- What is the setting? (vascular risk factors, elderly, young without risk factors)

Top 6 symptoms likely to be a TIA-1

- 6. Vertigo only if present with brainstem symptoms
- 5. Hemibody numbness
- 4. Double vision, crossed numbness or weakness, slurred speech, ataxia of gait

Top 6 symptoms likely to be a TIA - 2

- 3. Monocular or hemifield visual loss (not blurring of entire visual field)
- 2. Speech disturbance for a defined period of time (definite dysarthria, muteness or marked word finding difficulty, paraphasic speech)
- 1. Hemibody weakness

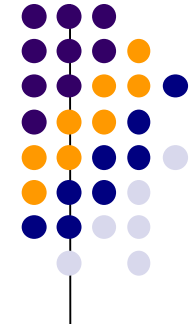
Symptoms unlikely to be a TIA - 2

- Positional and recurrent numbness of one limb or tingling of all 4 extremities
- Scintillating or flashing visual disturbances
- Symptoms of duration < 30 seconds
- Seizure or convulsions at onset
- Isolated syncope
- Postural dizziness alone

Features supportive of TIA or Stroke

- A well-defined onset time
- Definite focal neurological symptoms
- Presence of neurological signs on examination
- Being able to lateralize signs to the left or right side of the brain
- Being able to determine a clinical stroke subclassification

The Brain Attack Study; Stroke 2006; 37; 769-775



What is a TIA?

Definitions:

WHO: Ischemic focal neurological deficit lasting < 24 hr

Newer tissue based definition:

Rapidly resolving neurologic symptoms, typically lasting <1 hour, with no evidence of infarction on MRI (DWI)

(Albers et al. New Engl J Med; 2002; 347: 1713-1716)

- 40% - 60% of clinically diagnosed TIA patients have ischemic injury on DWI

(Ay et al. Cerebrovasc Dis; 2002; 13: 177-186)

Stroke Risk

Risk of stroke following a TIA is high:

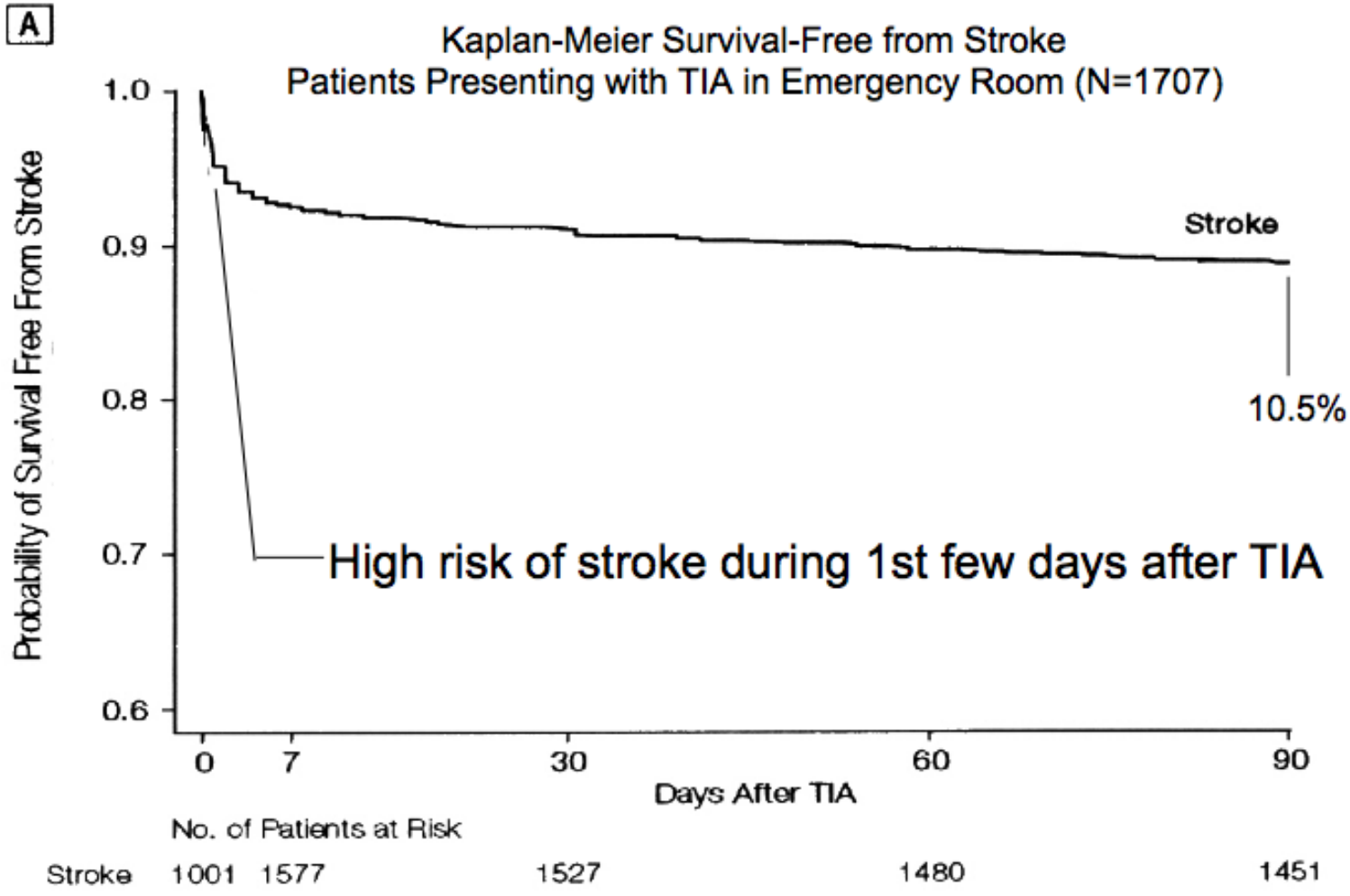
- 10-20% within 90 days
- 50% of these within the first 48 hours

Johnston et al. JAMA 2000; 284: 2901-06

~ 20%-40% of strokes are preceded by a TIA or non disabling stroke

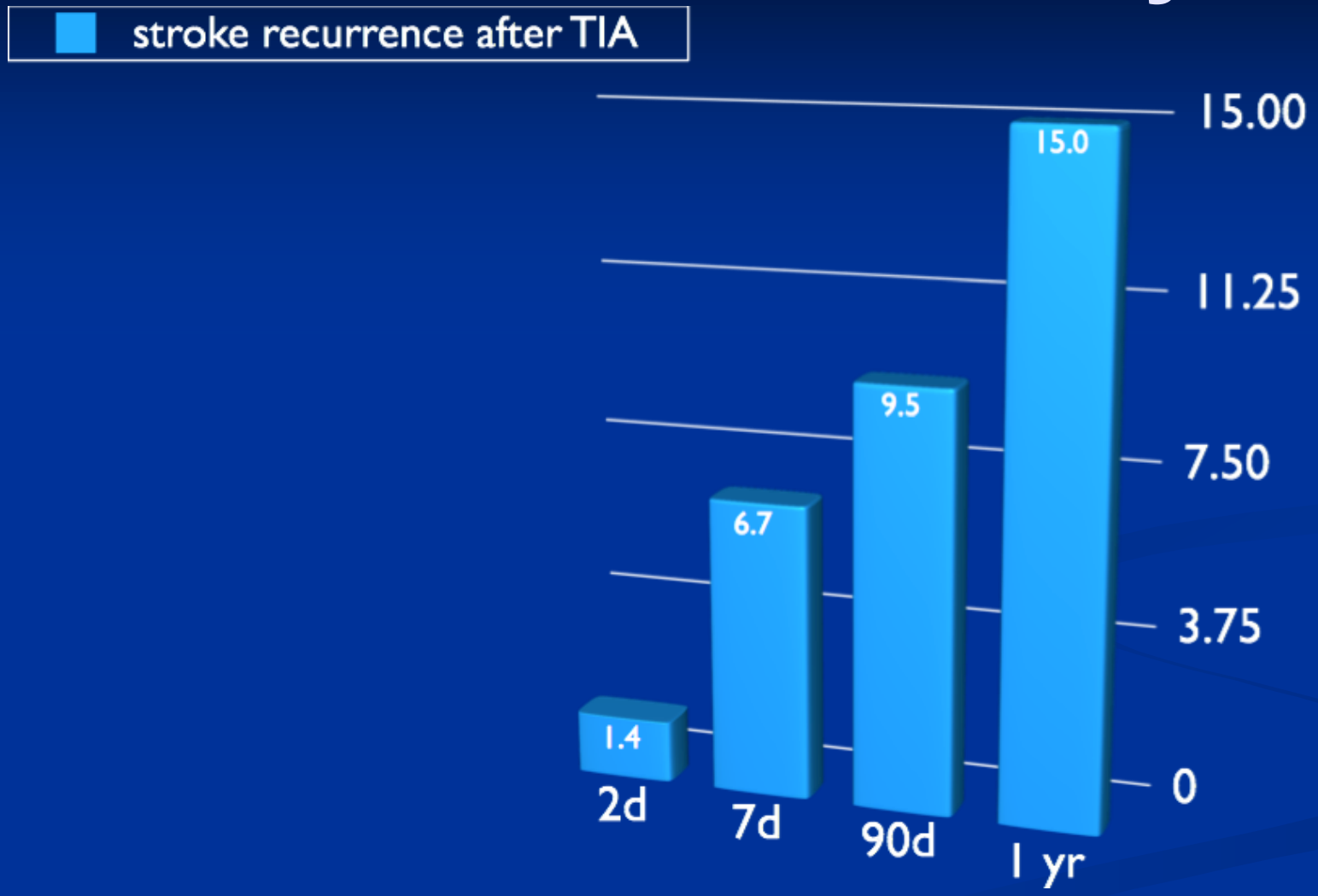
(Rothwell et al. Lancet Neurol 2006; 5: 323-331)

Golden Opportunity for Stroke Prevention!



JAMA 2000;284:2901-2906

Alberta TIA Study 2004



2285 ED visits for TIA across Alberta in one fiscal year

Neurology 2004;62;2015-20

ABCD² Score

Rothwell et al. Lancet; 2007; 369: 283-292

	Yes	No
Age ε 60 yrs	1	0
Bp ε 140/90	1	0
Clinical Features		
Unilateral weakness (with or without speech disturbance)	2	0
Speech deficit without weakness	1	0
Duration		
> 10 min < 59 min	1	0
ε 60 min	2	0
Diabetes	1	0

Score ε 4 = High Risk

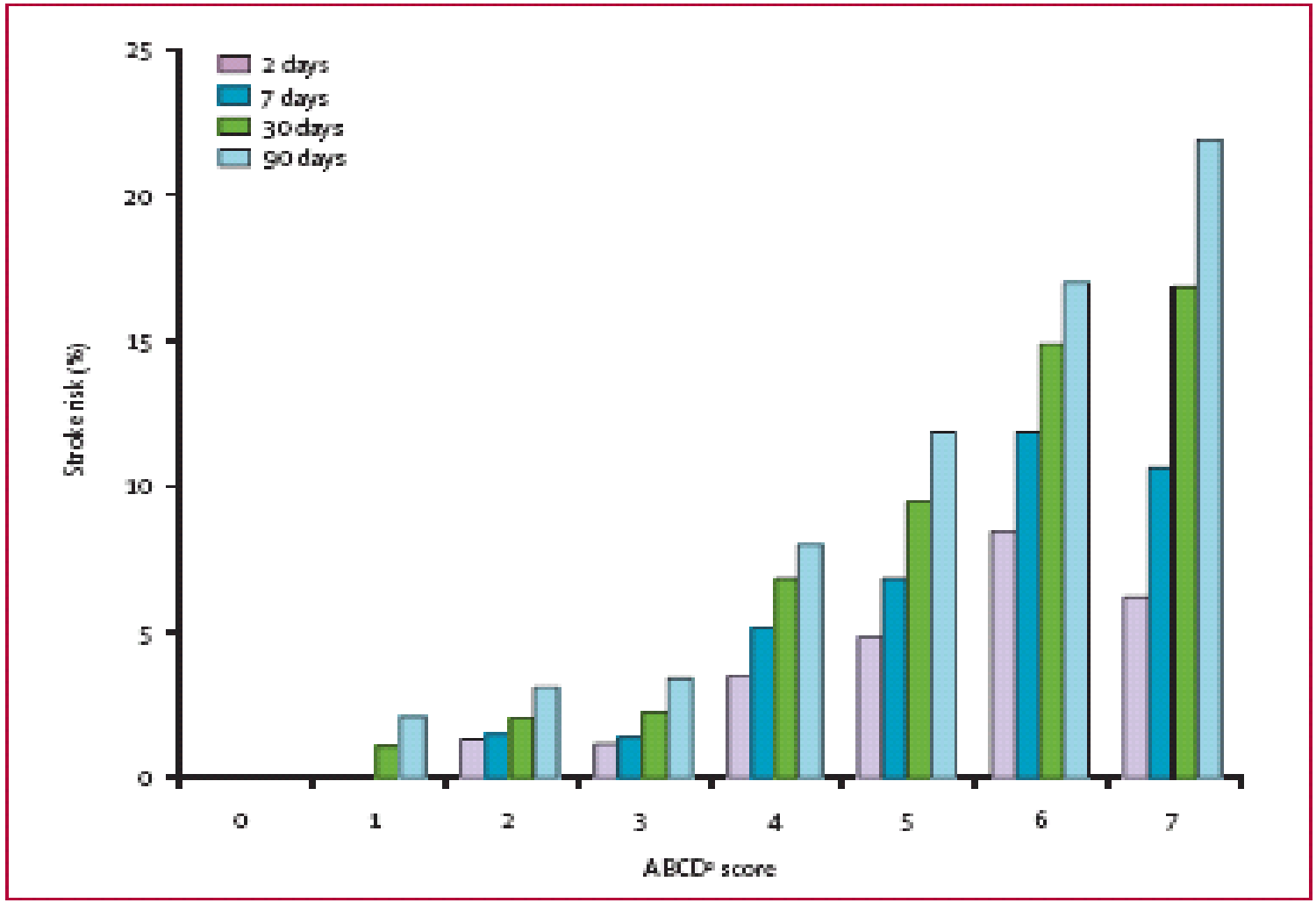
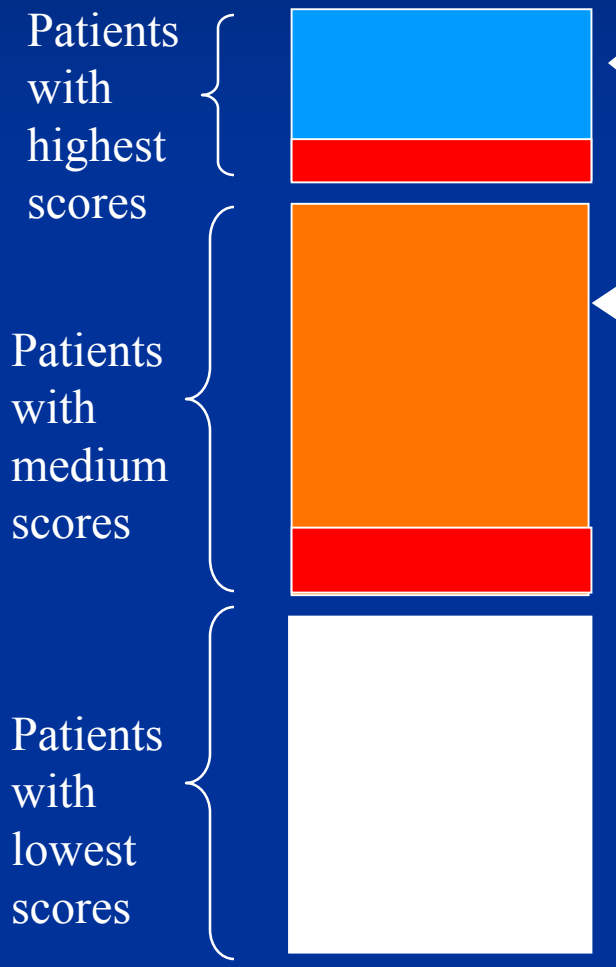


Figure: Short-term risk of stroke by ABCD² score in six groups combined (n=4799)

Predictive Value of the ABCD2 progostic score

Prognostic scores should not be used for screening:



Higher proportionate risk

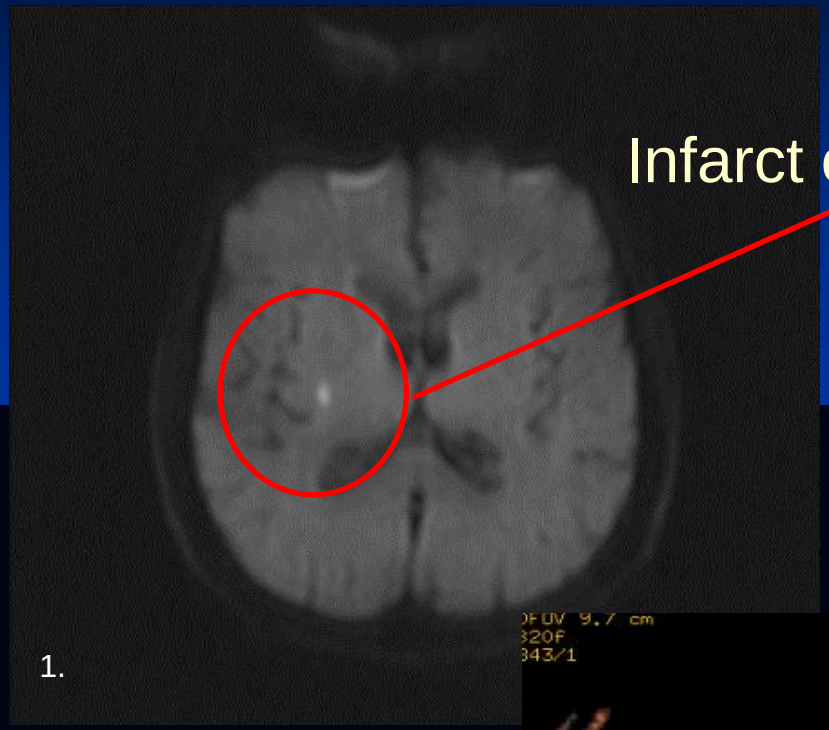
Higher actual numbers of strokes

= recurrent stroke

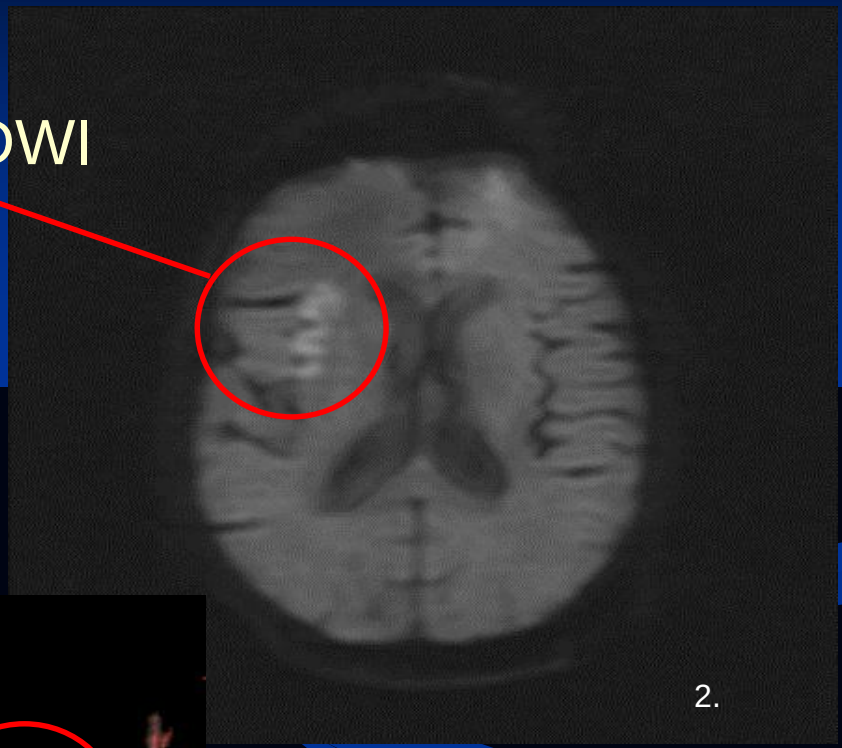
Most events actually occur in persons of medium risk because there are more of them. So be careful of too high a cutoff to define high risk!

High risk imaging features in TIA

Infarct on MRI DWI

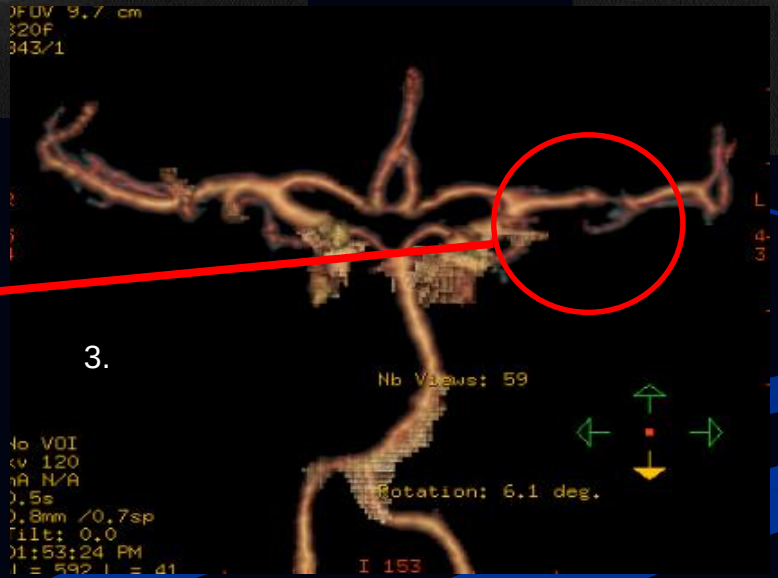


1.



2.

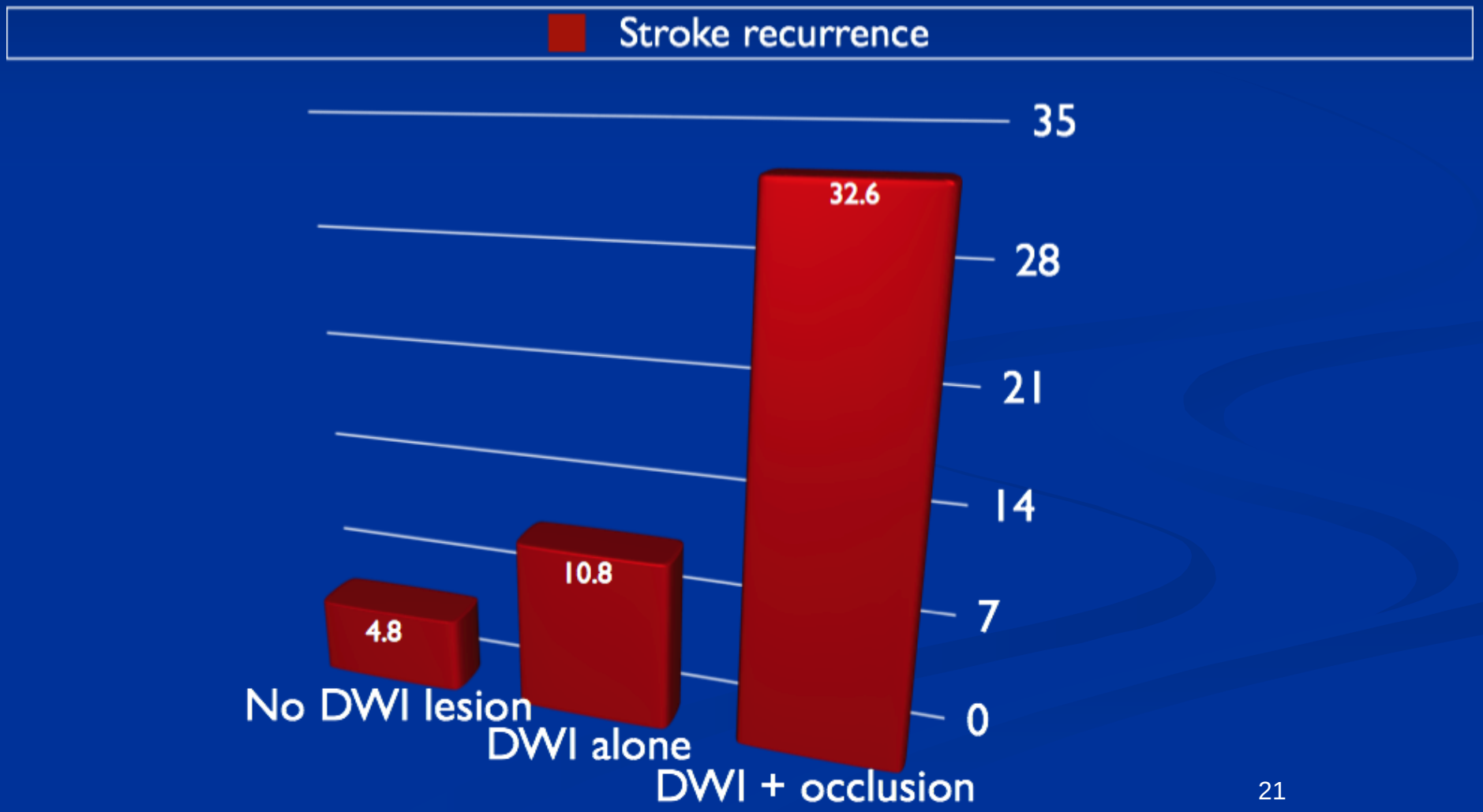
Arterial narrowing on CTA



3.

Triaging Transient Ischemic Attack and Minor Stroke Patients Using Acute Magnetic Resonance Imaging

Shelagh B. Coutts, MBChB,[1,2] Jessica E. Simon, MBChB,[1,2] Michael Eliasziw, PhD,[2,3] Chul-Ho Sohn, MD,[1,4] Michael D. Hill, MD,[2,3,5] Philip A. Barber, MBChB,[2] Vanessa Palumbo, MD,[1,2] James Kennedy, MBChB,[1,2,5] Jayanta Roy, MD,[1,2] Alexis Gagnon, MD,[1,2] James N. Scott, MD,[1,6] Alastair M. Buchan, MD,[2] and Andrew M. Demchuk MD[1,2]



ASPIRE/APSS TIA Triaging Project

- Consensus on urgent triage and assessment of TIA province-wide
- Facilitate urgent access using a TIA Hotline
- Backing of the Alberta Provincial Stroke Strategy

APSS
ALBERTA PROVINCIAL STROKE STRATEGY

MINOR STROKE/TIA STROKE RISK ASSESSMENT

HIGH RISK:

- Symptom onset within the last 48 hours with any one of the following:
  - ✓ Motor deficit lasting more than 5 minutes
  - ✓ Speech deficit lasting more than 5 minutes
  - ✓ $ABCD^2$ score ≥ 4
- Atrial fibrillation with TIA

MEDIUM RISK:

- Symptom onset between 48 hrs and 7 days with any one of the following:
  - ✓ Motor deficit lasting more than 5 minutes
  - ✓ Speech deficit lasting more than 5 minutes
  - ✓ $ABCD^2$ score ≥ 4

LOW RISK:

- Symptom onset > 7 days
- Symptom onset $\leq$ 7 days without the presence of high risk symptoms (speech deficit or motor deficit or $ABCD^2$ score ≥ 4 or atrial fibrillation with TIA)

Note: Isolated syncope or dizziness is rarely a TIA and may not require Stroke Prevention Clinic referral

$ABCD^2$ SCORING CHART

		Yes	No
Age	≥ 60 yrs	1	0
BP	≥ 140/90	1	0
Clinical Features			
• Unilateral weakness (with or without speech disturbance)		2	0
• Speech deficit without weakness		1	0
Duration			
	> 10 min < 59 min	1	0
	≥ 60 min	2	0
Diabetes		1	0

Score ≥ 4 = High Risk

INVESTIGATIONS

- CT scan of head
- Carotid Investigations: carotid ultrasound or CT angiogram
- ECG: if atrial fibrillation strongly consider anticoagulation
- Echocardiogram: only if suspicion of cardiac cause
- Holter Monitor: if suspect atrial fibrillation
- CBC, electrolytes, creatinine, glucose, PTT, INR, fasting glucose and lipid profile

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HIGH RISK: Contact TIA HOTLINE: see over
Complete investigations within 24 hours

* *May require referral to Primary or Comprehensive Stroke Centre to ensure timely completion of investigations*

Stroke Prevention Clinic Referral (seen within 24 hours)

MEDIUM RISK: Complete investigations within 3 days
Stroke Prevention Clinic Referral (seen within 3 days)

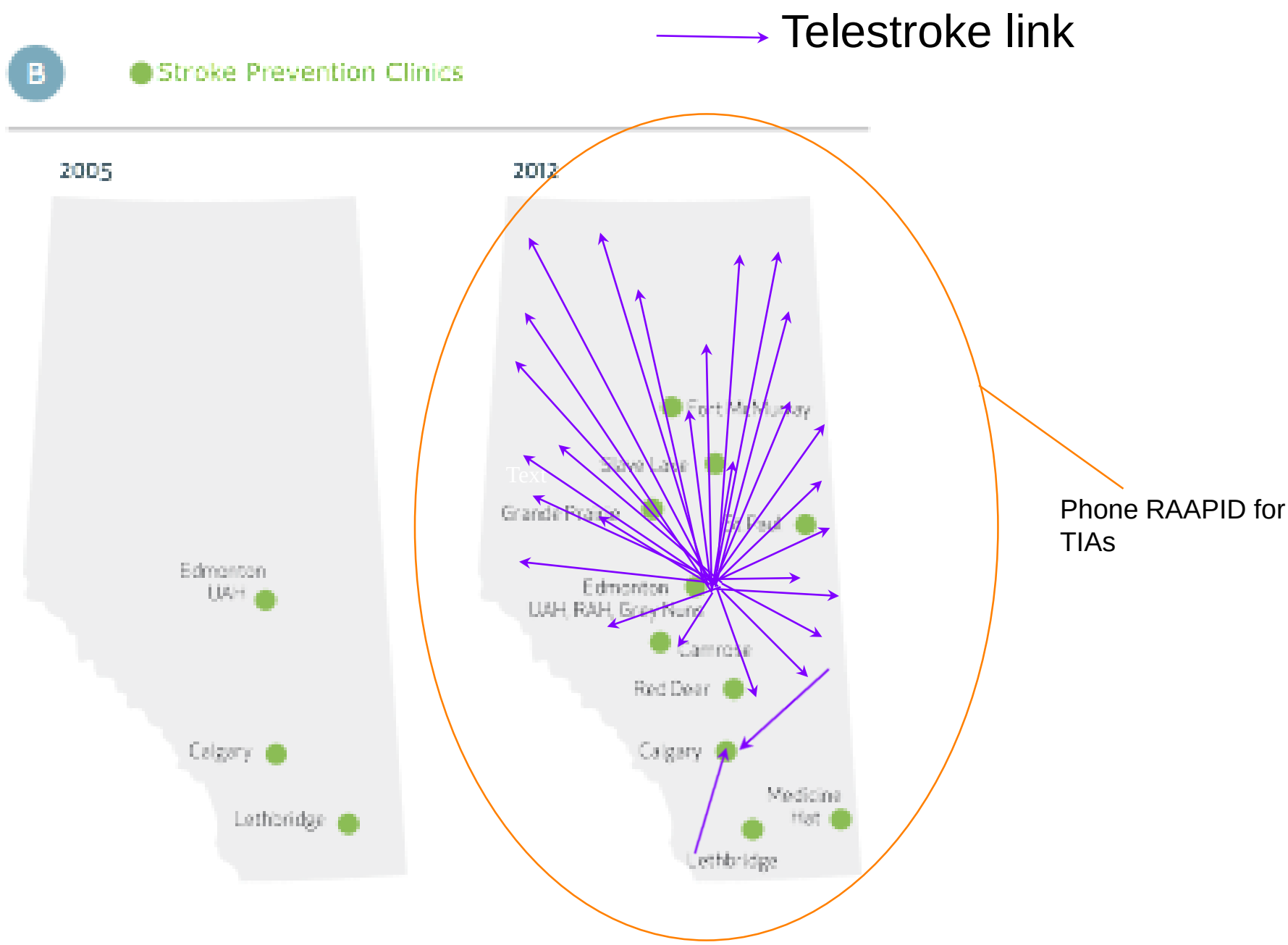
LOW RISK: Complete investigations within 2 weeks
Stroke Prevention Clinic Referral (seen within 2 weeks)

Alberta Provincial Stroke Strategy (2009). Secondary Stroke Prevention, retrieved from, http://www.strokestrategy.ab.ca

RAAPID North
Local 780-735-0812
1-800-735-0812

RAAPID South
1-800-661-1700

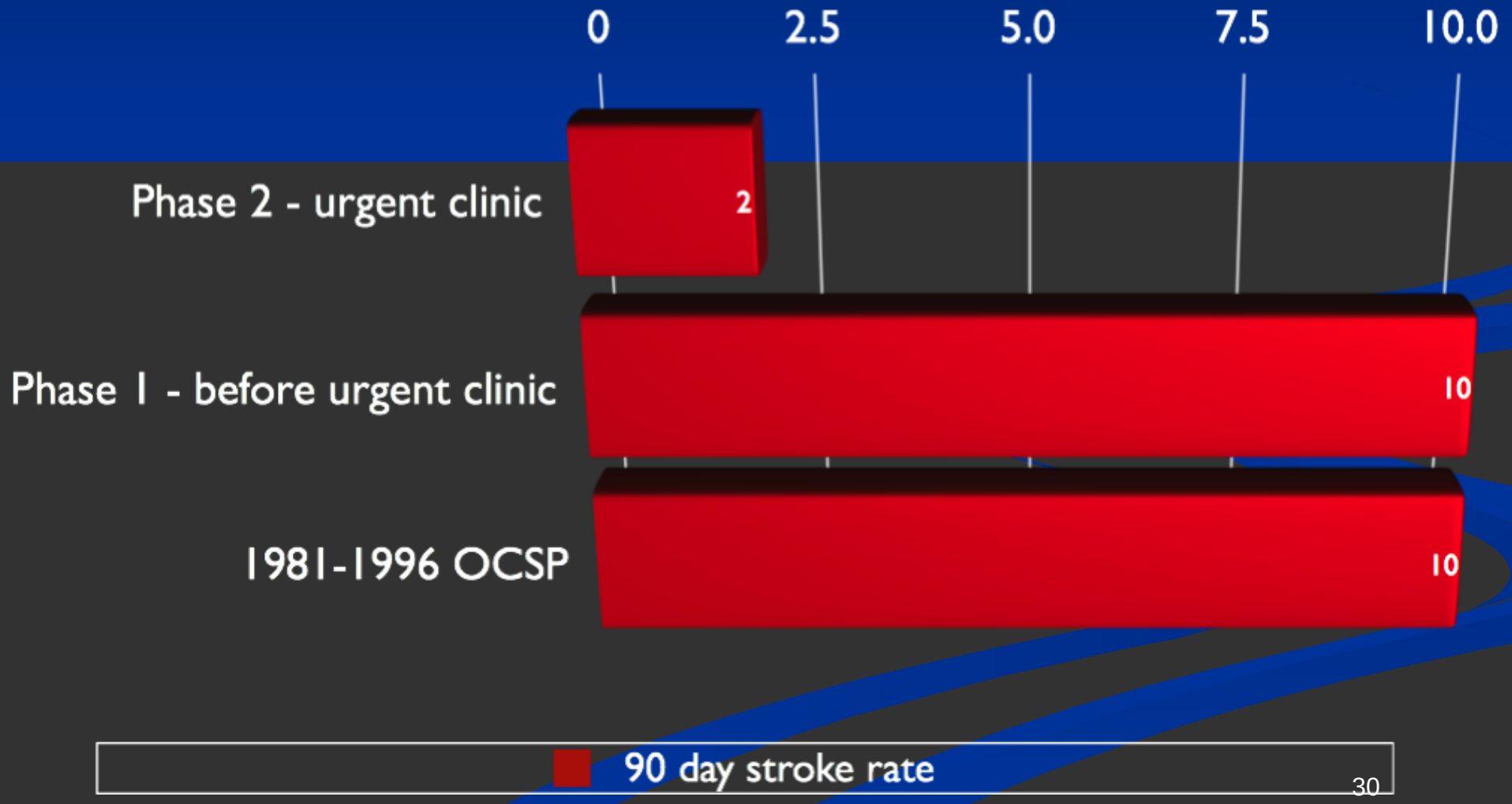
Technology -
Telestroke


Telestroke link
B
Stroke Prevention Clinics
2005
2013
Edmonton
UAH
Lethbridge
Calgary
Red Deer
Phone RAAPID for
TIAs

Canadian Best Practice Standards 2013

- TIA is an emergency
- Canadian Best Practice Standards 2013
  - TIA symptoms within the previous 48 hrs should be emergently evaluated
  - Symptoms of later onset (2d-2 weeks) within 24 hours
  - Beyond two weeks - within a month
- Revision in progress!
  - Will incorporate high risk clinical features of any speech or motor symptoms to be seen most urgently

The EXPRESS Study: Effect of rapid treatment of TIA

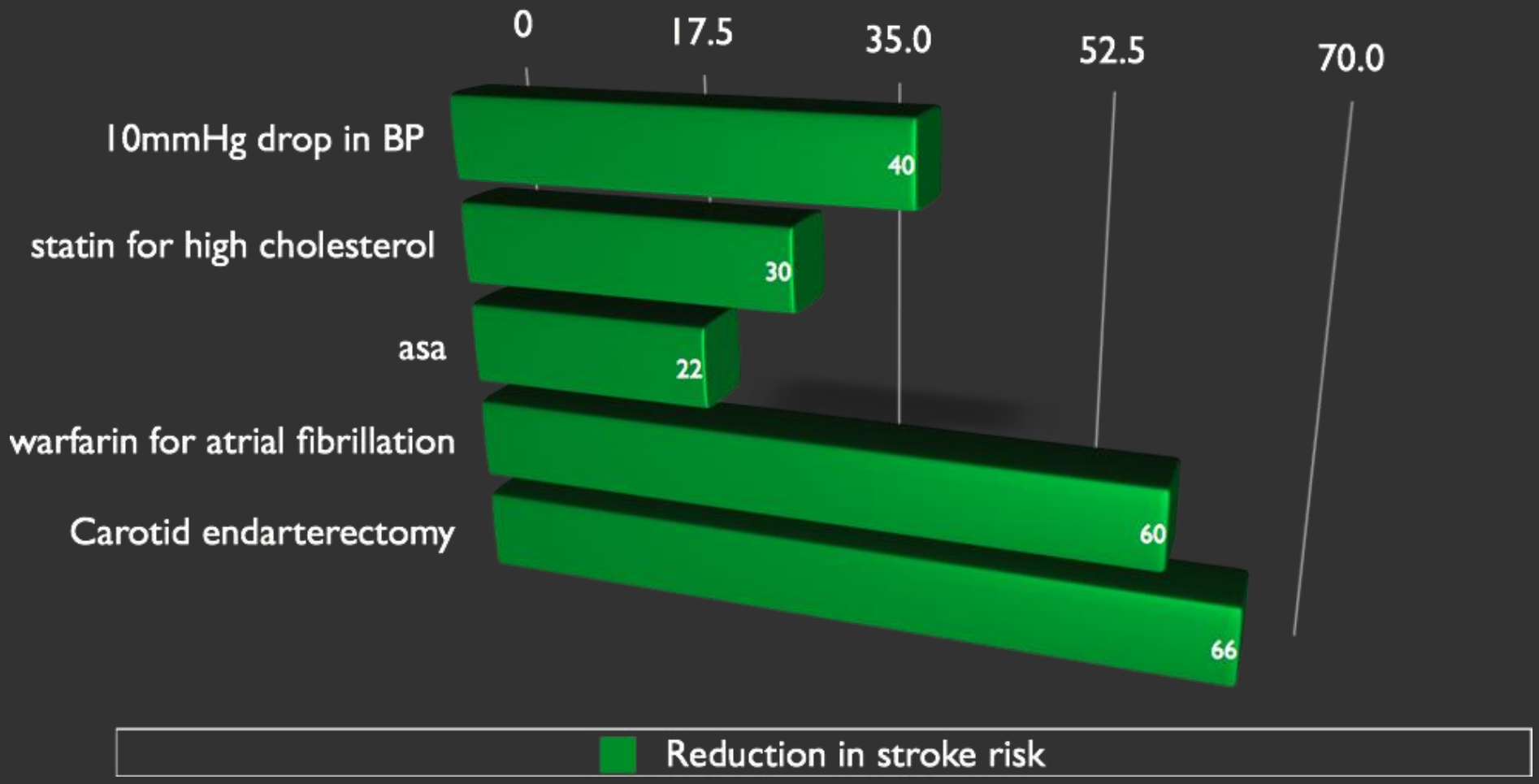


TIA Management

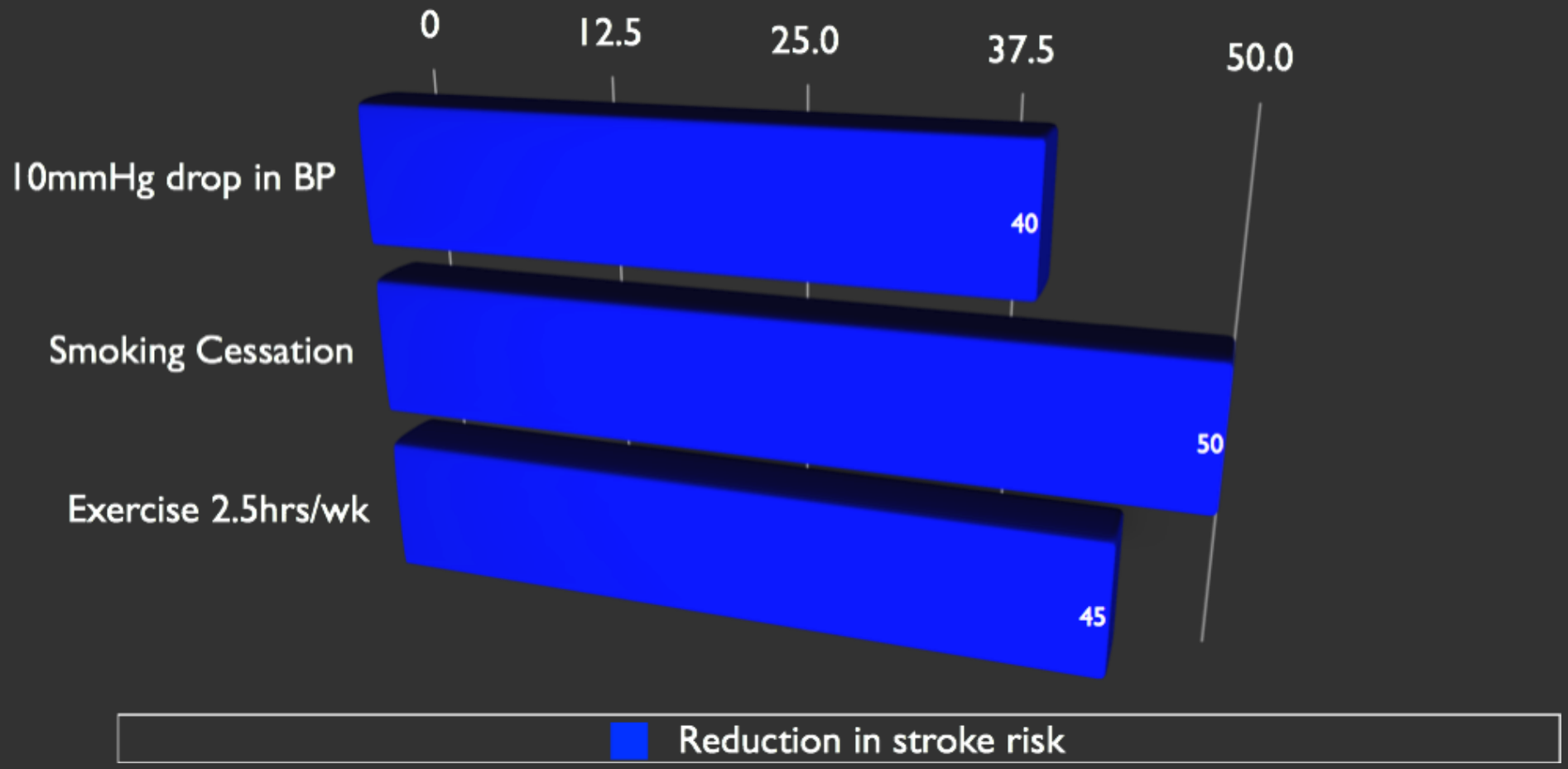
There are several proven medical therapies to prevent recurrent stroke

- Antiplatelet / Anticoagulation therapy
- Carotid Endarterectomy
- Blood pressure reduction
- Statins for dyslipidemia

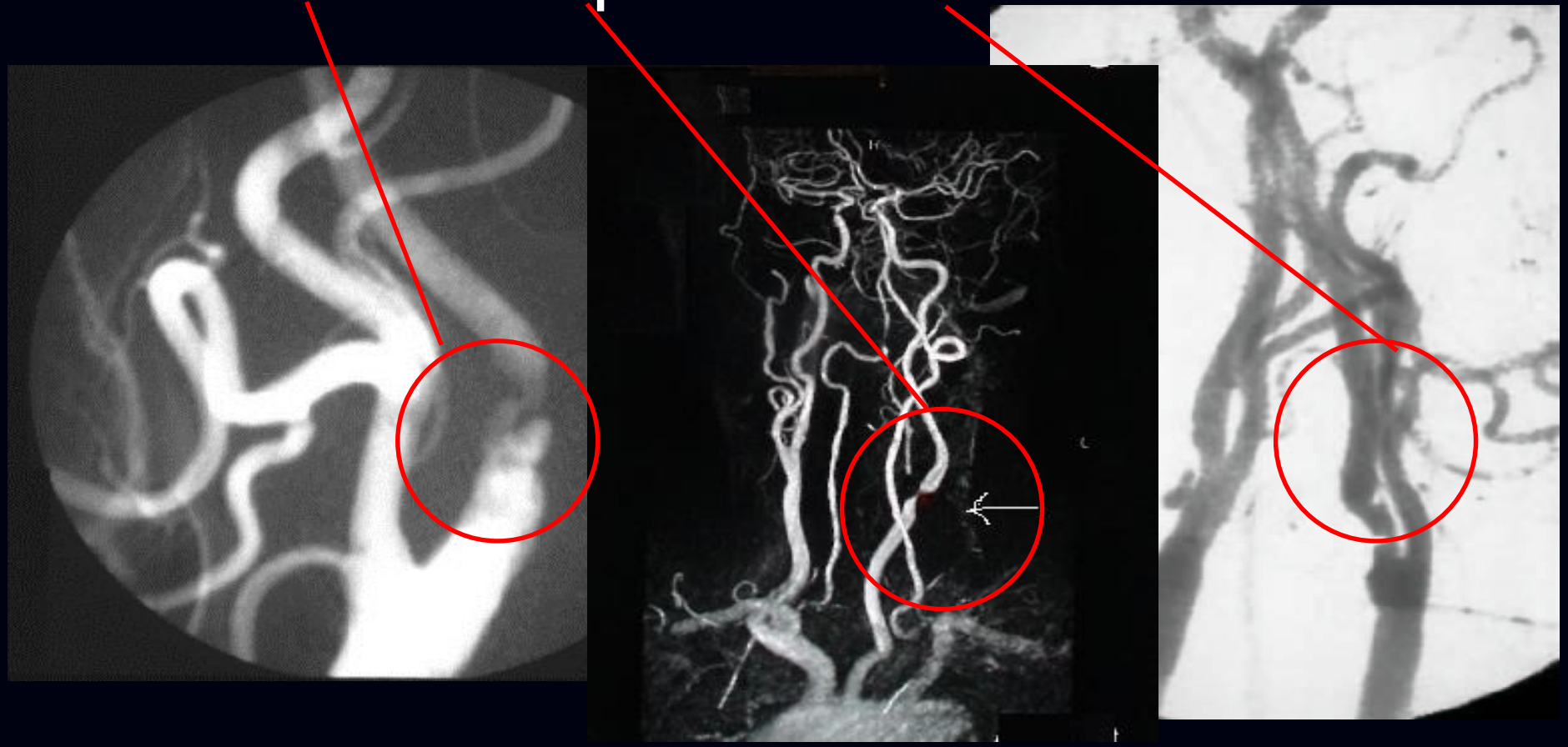
Relative Risk Reductions for stroke from medical therapy



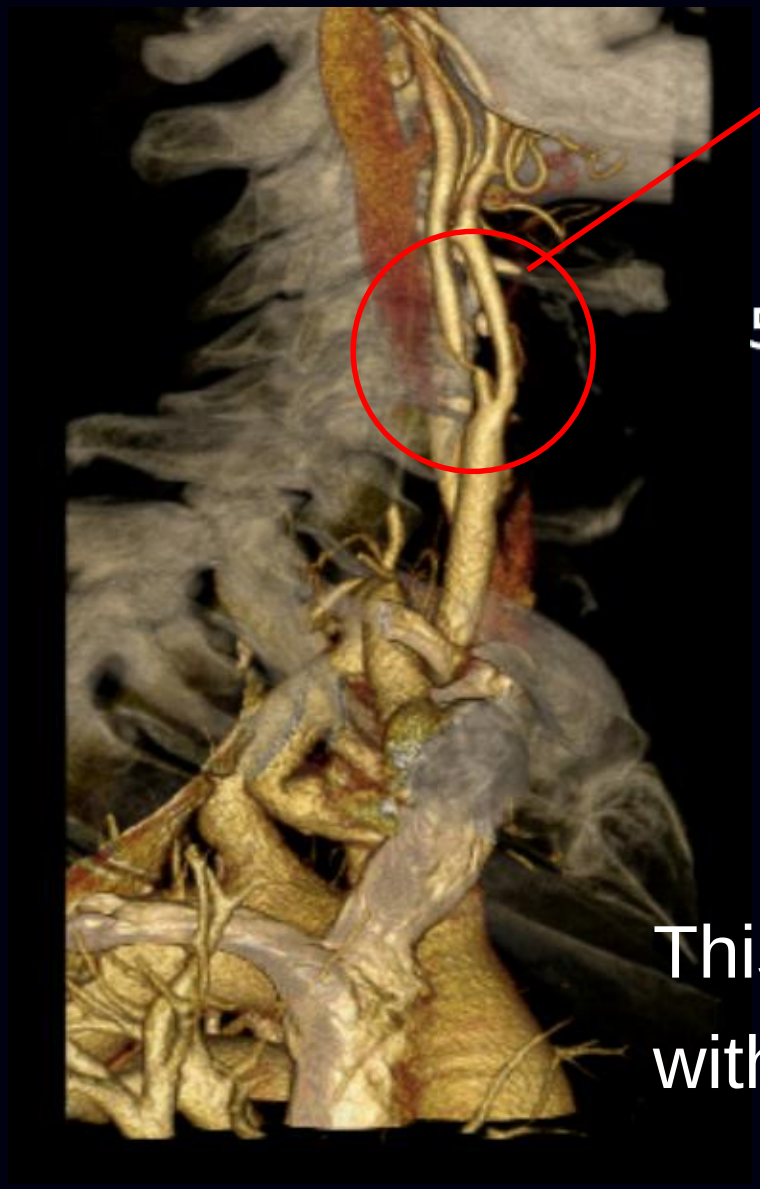
Relative Risk Reductions for stroke from lifestyle modification

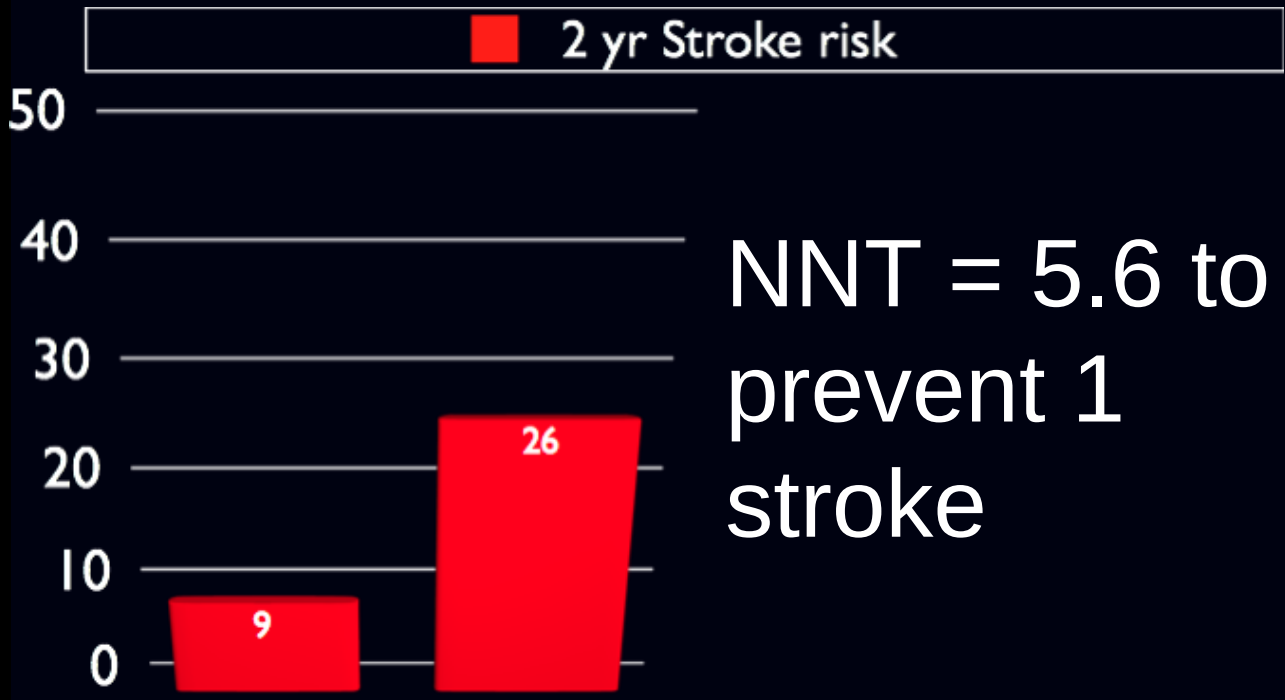


Symptomatic Carotid stenosis
-stroke risk as high as 42% at 2 years; 20% at 3 months if hemispheric TIA



- Symptomatic Carotid Stenosis



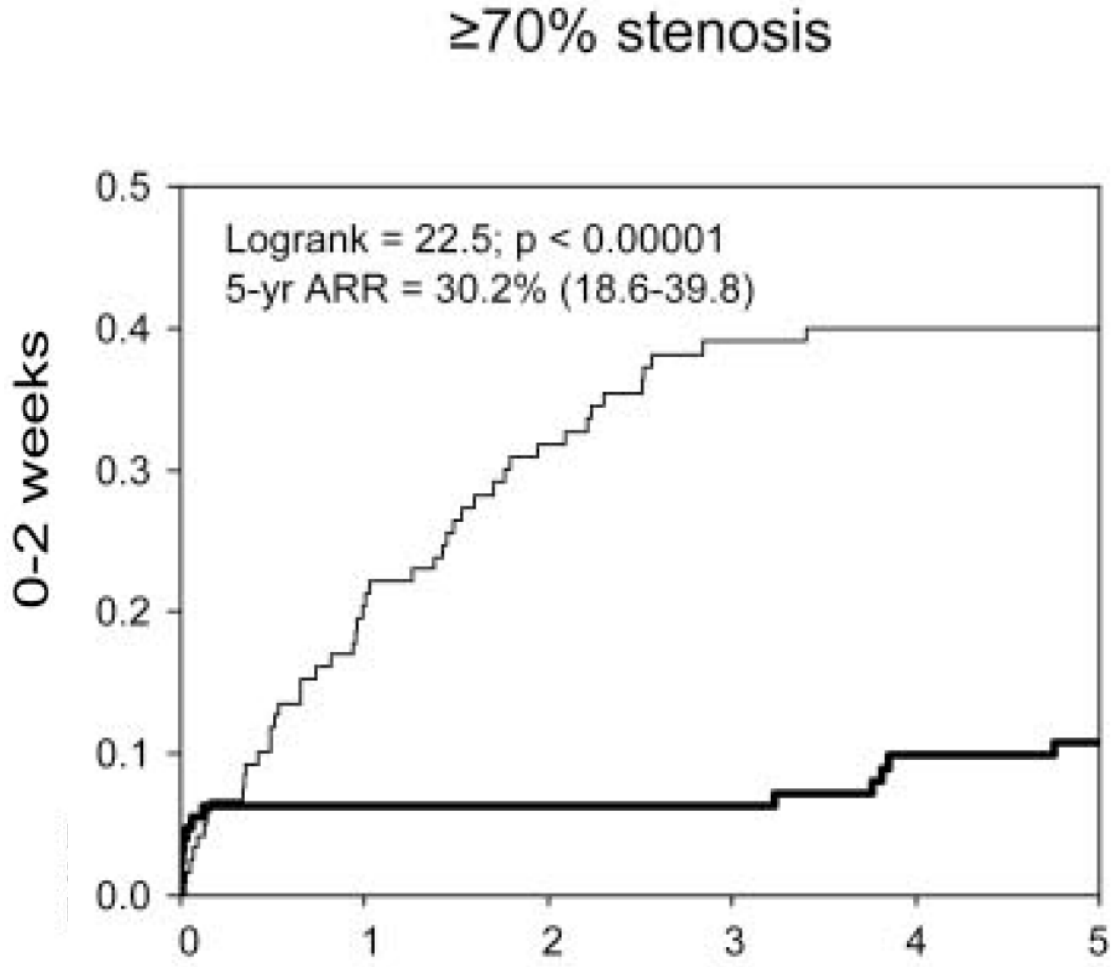


NNT = 5.6 to prevent 1 stroke

This benefit occurs if CEA performed within 6 months of symptoms.

Early Carotid Surgery Much Better >70% w/o near-occlusion

Rothwell PM et al. Stroke 2004;35:2855-2861.



NNT is 3 to prevent 1 stroke! Benefit MAY be neutral after 2 weeks in women and 12 weeks in men

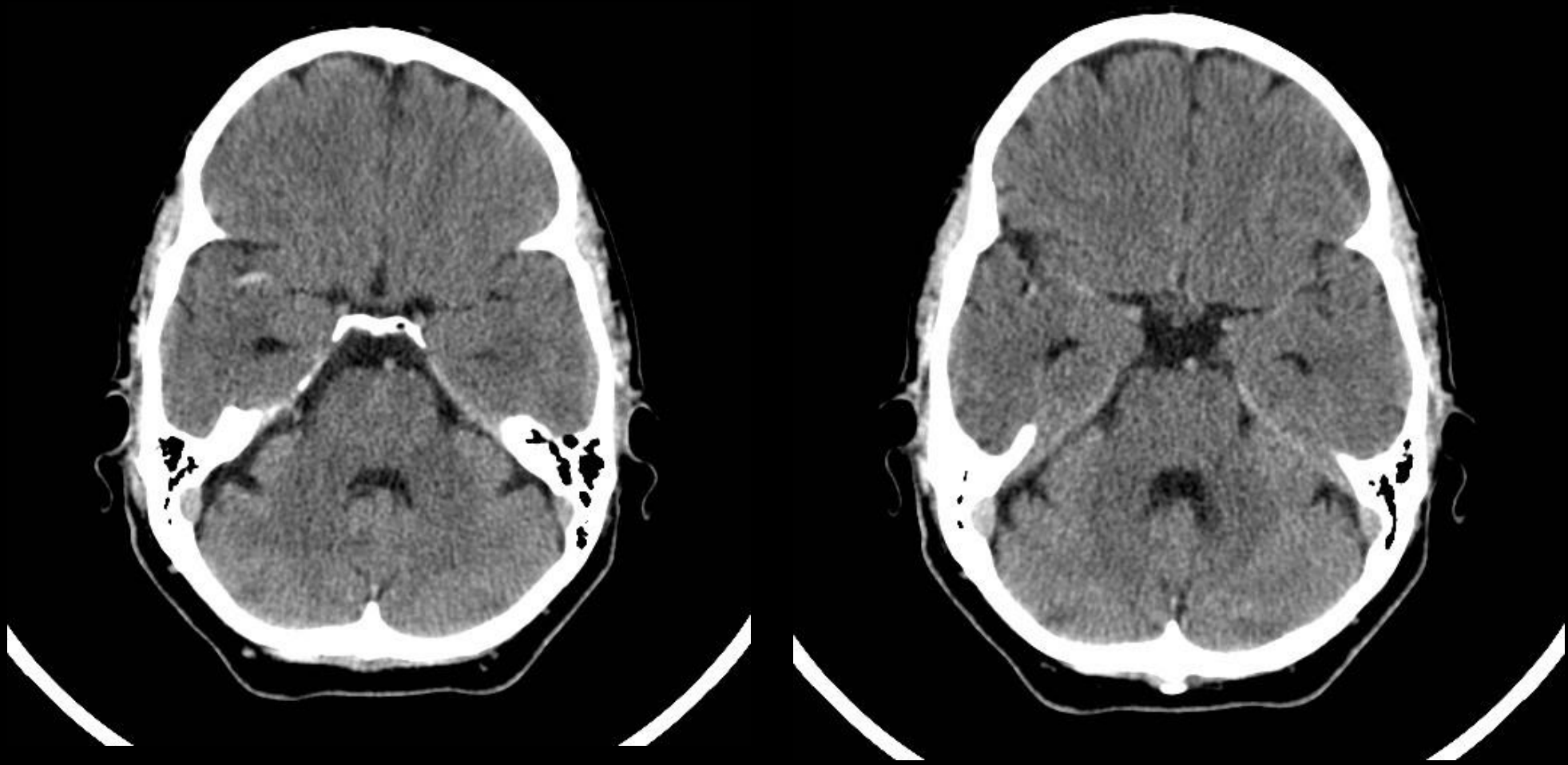
Carotid Endarterectomy

If TIA due to ≥ 50% stenosis in extracranial internal carotid artery consider CEA

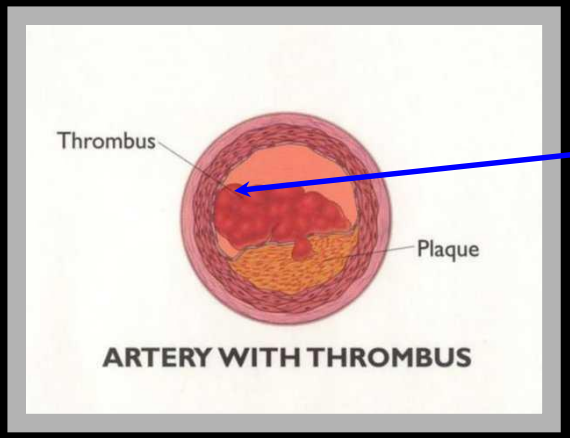
- Women will benefit from CEA if they have >= 70% symptomatic stenosis
- Men will benefit from CEA if they have > 50% symptomatic stenosis
  - The benefit is less in the 50-70% range and clinical judgement is required

Greatest benefit if surgery within 2 weeks

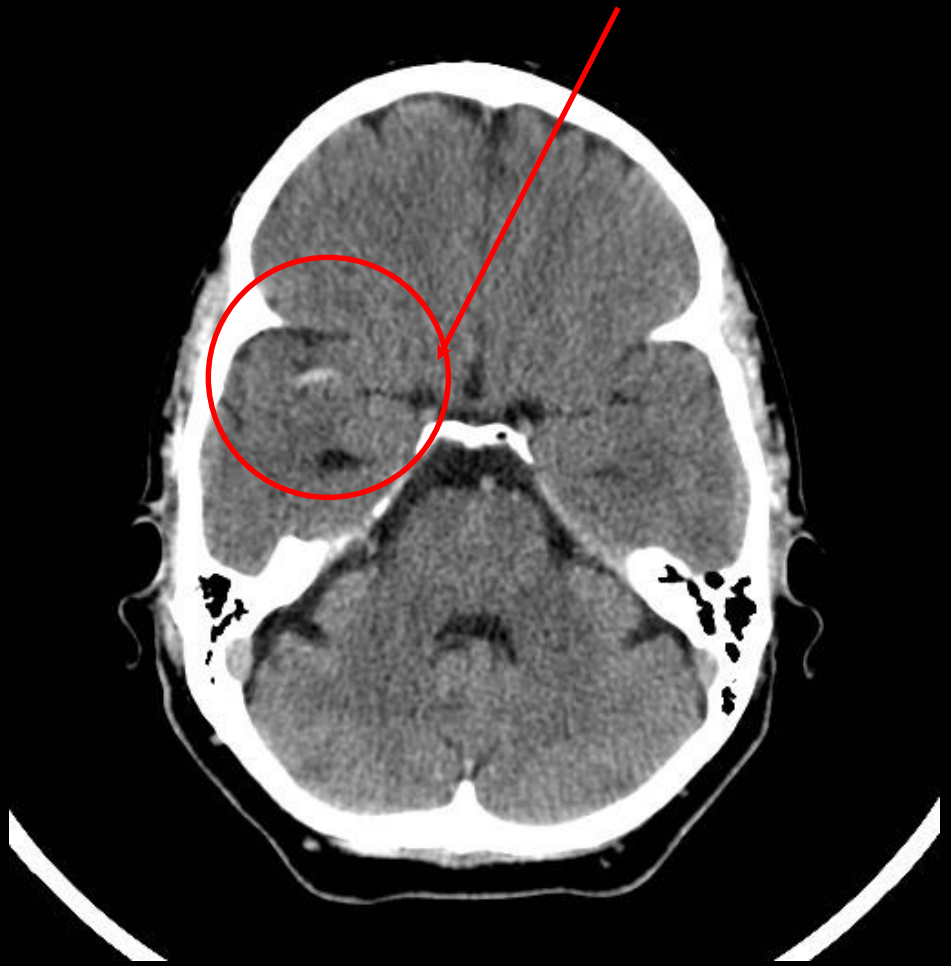
Patient 1



Patient 1’s brain CT scan



Clot visible blocking the middle cerebral artery (inside artery)



Who wants to load him with a second antiplatelet agent?

The NEW ENGLAND JOURNAL of MEDICINE

N Engl J Med 2013;369:11-19.
DOI: 10.1056/NEJMoa1215340

ORIGINAL ARTICLE

Clopidogrel with Aspirin in Acute Minor Stroke or Transient Ischemic Attack

Yongjun Wang, M.D., Yilong Wang, M.D., Ph.D., Xingquan Zhao, M.D., Ph.D., Liping Liu, M.D., Ph.D., David Wang, D.O., F.A.H.A., F.A.A.N., Chunxue Wang, M.D., Ph.D., Chen Wang, M.D., Hao Li, Ph.D., Xia Meng, M.D., Ph.D., Liying Cui, M.D., Ph.D., Jianping Jia, M.D., Ph.D., Qiang Dong, M.D., Ph.D., Anding Xu, M.D., Ph.D., Jinsheng Zeng, M.D., Ph.D., Yansheng Li, M.D., Ph.D., Zhimin Wang, M.D., Haiqin Xia, M.D., and S. Claiborne Johnston, M.D., Ph.D., for the CHANCE Investigators*

- 'CHANCE' - RDBPC Trial
- 114 Centres in China - 5170 patients within 24 hours of high risk TIA or minor stroke
- Clopidogrel load 300mg then 75mg per day for 90 days and Asa 75-300 mg per day on day 1; then 75mg daily for 21 days
- Vs aspirin 75mg/d and clopidogrel placebo for 3 months

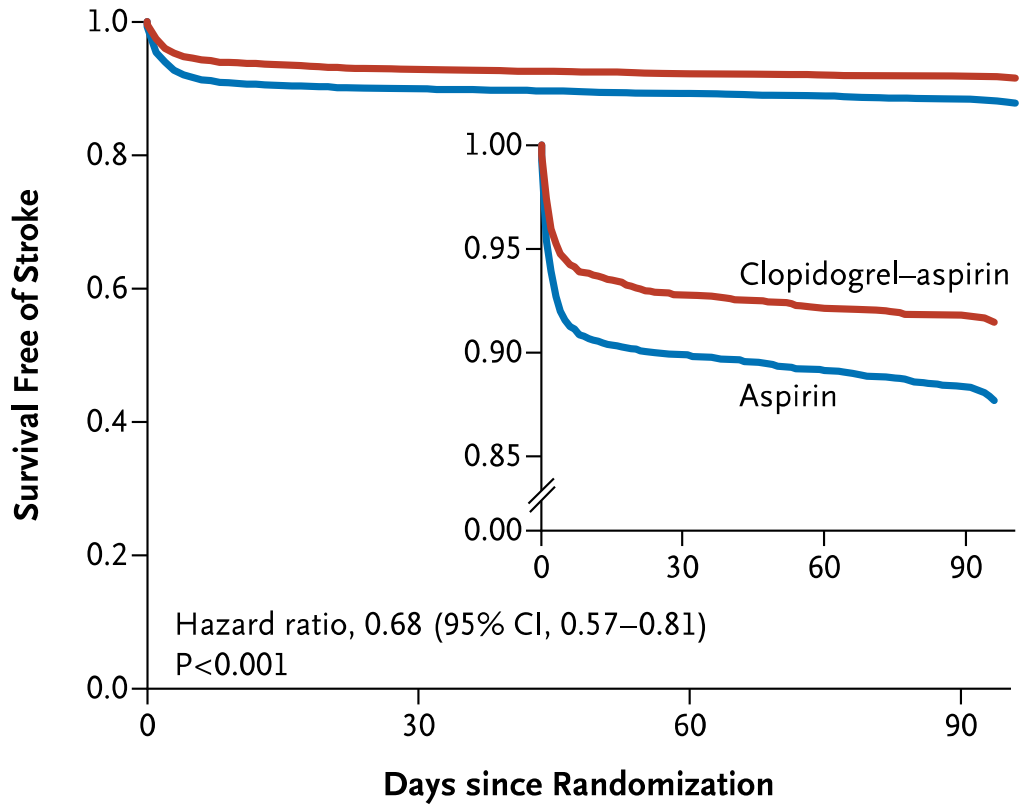
Table 2. Efficacy and Safety Outcomes.

Outcome	Aspirin (N=2586)		Clopidogrel and Aspirin (N=2584)		Hazard Ratio (95% CI)	P Value
	Patients with Event *no.*	Event Rate %	Patients with Event *no.*	Event Rate %		
Primary outcome						
Stroke	303	11.7	212	8.2	0.68 (0.57–0.81)	<0.001
Secondary outcomes						
Stroke, myocardial infarction, or death from cardiovascular causes	307	11.9	216	8.4	0.69 (0.58–0.82)	<0.001
Ischemic stroke	295	11.4	204	7.9	0.67 (0.56–0.81)	<0.001
Hemorrhagic stroke	8	0.3	8	0.3	1.01 (0.38–2.70)	0.98
Myocardial infarction	2	0.1	3	0.1	1.44 (0.24–8.63)	0.69
Death from cardiovascular causes	5	0.2	6	0.2	1.16 (0.35–3.79)	0.81
Death from any cause	10	0.4	10	0.4	0.97 (0.40–2.33)	0.94
Transient ischemic attack	47	1.8	39	1.5	0.82 (0.53–1.26)	0.36
Safety outcomes						
Bleeding*						
Severe	4	0.2	4	0.2	0.94 (0.24–3.79)	0.94
Moderate	4	0.2	3	0.1	0.73 (0.16–3.26)	0.68
Mild	19	0.7	30	1.2	1.57 (0.88–2.79)	0.12
Any bleeding	41	1.6	60	2.3	1.41 (0.95–2.10)	0.09

N Engl J Med 2013;369:11-19.
DOI: 10.1056/NEJMoa1215340

- ‘CHANCE’ - results
- Lower stroke risk at 90 days
- Lower stroke/MI/vascular death (but all driven by stroke!)
- No significant bleeding excess

N Engl J Med 2013;369:11-19.
DOI: 10.1056/NEJMoa1215340



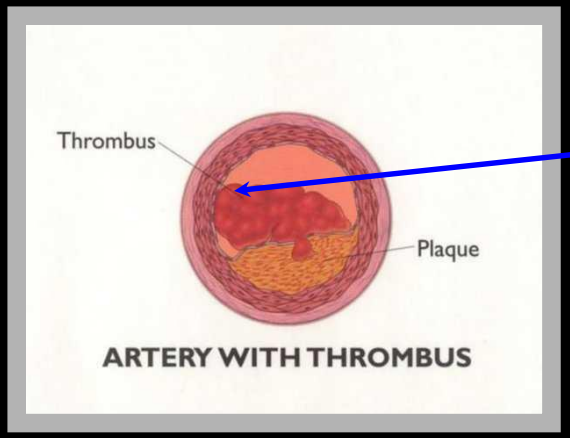
No. at Risk

Aspirin	2586	2307	2287	1906
Clopidogrel–aspirin	2584	2376	2361	1989

Figure 1. Probability of Survival Free of Stroke.

The primary outcome was ischemic or hemorrhagic stroke. The inset shows the same data on an enlarged segment of the y axis.

- 'CHANCE' - results
- The curves separated in the first week then remained parallel
- Remember ASA and clopidogrel for three weeks then clopidogrel to 3 months vs asa alone and clopidogrel placebo



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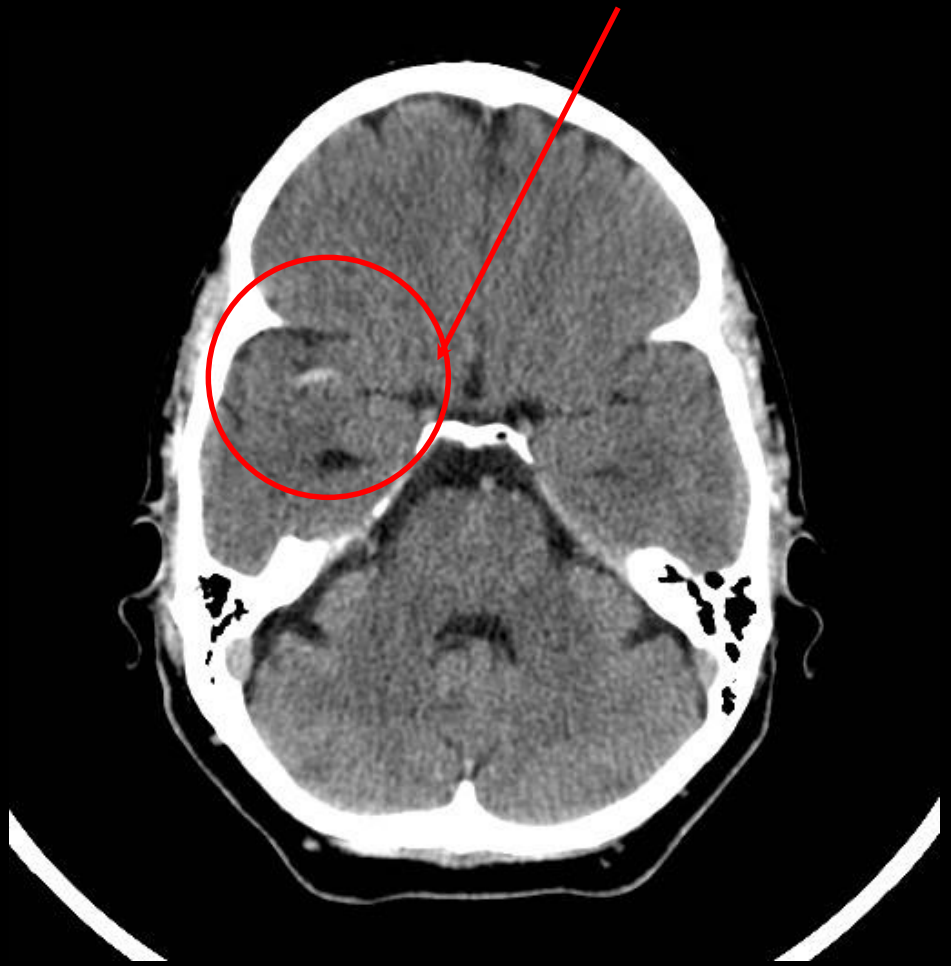

Who wants to load him with a second antiplatelet agent?
Or would you like to wait until the North American POINT Trial publishes in 2016?
POINT is a RDBPCT of dual vs single within 12 hours from TIA

Patient Patricia

- 75 year old lady with HT, dyslipidemia, early Parkinson's disease
- Reports while sitting felt nauseated and ill
- Developed severe lightheadedness; blurring of periphery of vision bilaterally; tingling lips and fingertips bilaterally
- Brief loss of consciousness; felt unable to rise for a few minutes afterwards due to severe lightheadedness

Patricia

- Not a TIA; presyncope likely

Patient Margaret

- Margaret is a 77 year old female with prior SAH, smoking 40PY, hypertension
- Today experiences sudden inability to speak with unintelligible sounds ‘da, da, da’ which lasted 3 minutes
- Then she collapsed to the ground and had jaw clenching and her body went stiff
- She was unrousable but after 45 minutes had recovered

Patient Margaret

- Was it a TIA?

- She later had two recurrences of the same symptoms

Brain CT with SAH 8mos ago

Brain CT now

Margaret

- Not a TIA
- Likely secondary generalized seizure

Patient Don

- 76 year old male with obesity, HT, diabetes, elevated cholesterol seen in the SPC 1 day after an ‘event’
- Loss of sensation and mild weakness of the left arm; the symptoms had a sudden onset at exactly 1330 and completely resolved after 65 minutes;
- BP in the ED was 145/97
- Was it a TIA? If so what was the ABCD2 score?

Patient Don -2

- TIA
- From the ASPIRE/TIA Triaging Algorithm or from using other best practise guidelines how quickly should this patient receive investigation and consultation?

APSS
ALBERTA PROVINCIAL STROKE STRATEGY

MINOR STROKE/TIA STROKE RISK ASSESSMENT

HIGH RISK:

- Symptom onset within the last 48 hours with any one of the following:
  - ✓ Motor deficit lasting more than 5 minutes
  - ✓ Speech deficit lasting more than 5 minutes
  - ✓ $ABCD^2$ score ≥ 4
- Atrial fibrillation with TIA

MEDIUM RISK:

- Symptom onset between 48 hrs and 7 days with any one of the following:
  - ✓ Motor deficit lasting more than 5 minutes
  - ✓ Speech deficit lasting more than 5 minutes
  - ✓ $ABCD^2$ score ≥ 4

LOW RISK:

- Symptom onset > 7 days
- Symptom onset $\leq$ 7 days without the presence of high risk symptoms (speech deficit or motor deficit or $ABCD^2$ score ≥ 4 or atrial fibrillation with TIA)

Note: Isolated syncope or dizziness is rarely a TIA and may not require Stroke Prevention Clinic referral

$ABCD^2$ SCORING CHART

		Yes	No
Age	≥ 60 yrs	1	0
BP	≥ 140/90	1	0
Clinical Features			
• Unilateral weakness (with or without speech disturbance)		2	0
• Speech deficit without weakness		1	0
Duration			
	> 10 min < 59 min	1	0
	≥ 60 min	2	0
Diabetes		1	0

Score ≥ 4 = High Risk

Patient Don -2

- From the ASPIRE/TIA Triaging Algorithm or from using other best practise guidelines how quickly should this patient receive investigation and consultation?

- HIGHEST RISK: complete investigations and consultations within 24 hours

Patient Don -3

- If you are in private practice and seeing Don today in your clinic what options are available to you to expedite his care?

INVESTIGATIONS

- CT scan of head
- Carotid Investigations: carotid ultrasound or CT angiogram
- ECG: if atrial fibrillation strongly consider anticoagulation
- Echocardiogram: only if suspicion of cardiac cause
- Holter Monitor: if suspect atrial fibrillation
- CBC, electrolytes, creatinine, glucose, PTT, INR, fasting glucose and lipid profile

HIGH RISK: Contact TIA HOTLINE: see over
Complete investigations within 24 hours

* *May require referral to Primary or Comprehensive Stroke Centre to ensure timely completion of investigations*

Stroke Prevention Clinic Referral (seen within 24 hours)

MEDIUM RISK: Complete investigations within 3 days
Stroke Prevention Clinic Referral (seen within 3 days)

LOW RISK: Complete investigations within 2 weeks
Stroke Prevention Clinic Referral (seen within 2 weeks)

Alberta Provincial Stroke Strategy (2009). Secondary Stroke Prevention, retrieved from, http://www.strokestrategy.ab.ca

Patient Don -3

- If you are in private practice and seeing Don today in your clinic what options are available to you to expedite his care?

- 1) arrange assessment on an inpatient basis via an emergency department
- 2) Call RAAPID and ask for the TIA Hotline and speak to the stroke neurology (South) or telestroke (North) teams

RAAPID North
Local 780-735-0812
1-800-735-0812

RAAPID South
1-800-661-1700

Learning Objectives

Upon completion of this session, participants will be able to:

- Diagnose likely TIA syndromes
- Identify and manage the high risk TIA urgently
- Understand how to access rapid care for TIA

- Best Practice Recommendations are suggesting increasing speed of assessment!

THANK YOU!

Government of Alberta

Alberta

Alberta Health Services

APSS
ALBERTA PROVINCIAL STROKE STRATEGY

The ASPIRE/ TIA Hotline Project

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada
Institute of Circulatory and Respiratory Health
Institut de la santé circulatoire et respiratoire

Canadian Stroke Network
Réseau Canadien contre les accidents cérébrovasculaires

HEART & STROKE FOUNDATION OF CANADA
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Finding answers. For life.
À la conquête de solutions.