

# Update on TIA and Acute Stroke Management

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## Summary

### ACUTE STROKE MANAGEMENT

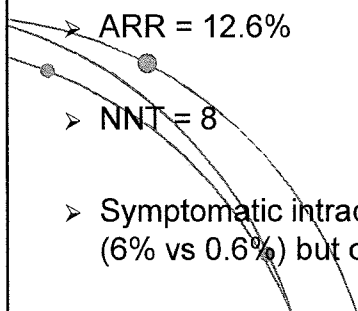
- IV thrombolysis
- Thrombectomy
  - 2 cases
  - The Evidence

### TIA

- What to do
  - Risk stratification

## IV THROMBOLYSIS - NINDS Trial

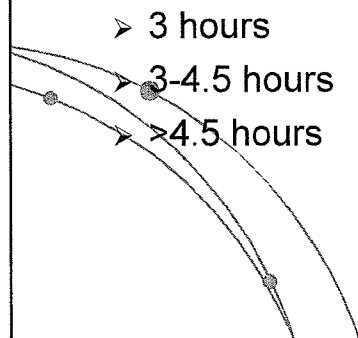
- FDA Approval 1996
- 624 patients, randomised to placebo or rt-PA
  - Within 3 hours of symptom onset
- Reduction in death and disability from 67.8 % to 55.2%



- ARR = 12.6%
- NNT = 8
- Symptomatic intracranial haemorrhage was increased (6% vs 0.6%) but overall mortality was not different

## The evidence for IV thrombolysis (Alteplase)

- 9 RCTs
- 6756 patients



- 3 hours                      NNT 10
- 3-4.5 hours                NNT 19
- >4.5 hours                NNT 50 (NS)

Emberson et al. The Lancet, 2014 Volume 384, No. 9958

## Stroke: Effectiveness of intervention (NNT)

- Aspirin 100
  - Clopidogrel/Asasantin 80 - 90
  - Hypertension management 50
  - Smoking cessation 43
  - **Stroke unit care 18**
  - Anticoagulation in Atrial fibrillation 12
  - **Acute thrombolysis 10**
- 

## Problems with iv thrombolysis

- Patients with large vessel occlusion
- High risk of haemorrhage

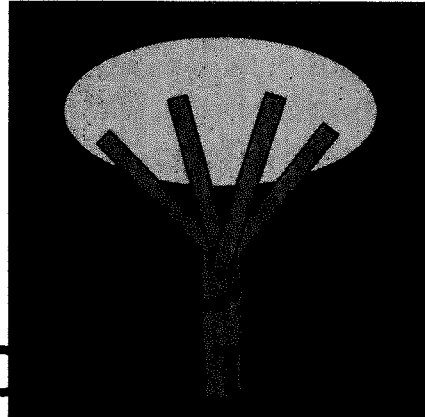
➤ Very limited time window (4.5 hours, 3 hours)

## ivTPA is a good treatment but not for all

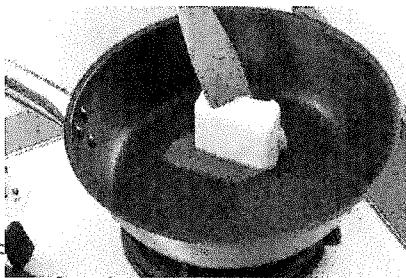
TPA chance of success – less  
than 20%, chance of bleed high



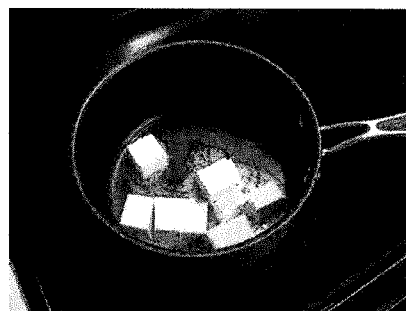
TPA likely to be effective,  
bleeding risk likely to be low



## Cooking



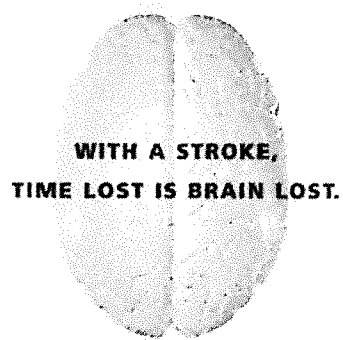
Large thrombus = small surface area  
Hence, slow recanalisation



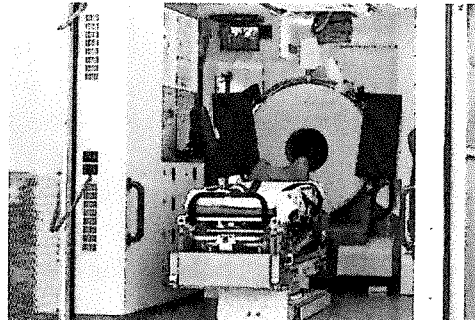
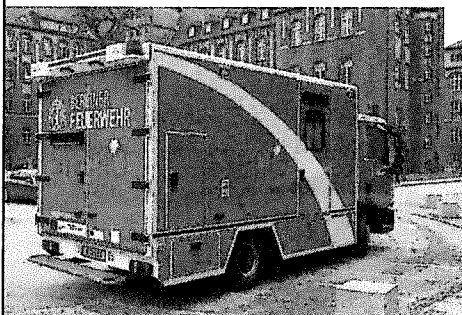
Same volume of thrombus but  
fragmented = large surface area  
Hence, faster recanalisation

# Time is Brain ! Every minute counts

- > 1.9 million neurones
- > 14 billion synapses
- > 12 km of myelinated fibres



## STEMO : Stroke Emergency Mobile



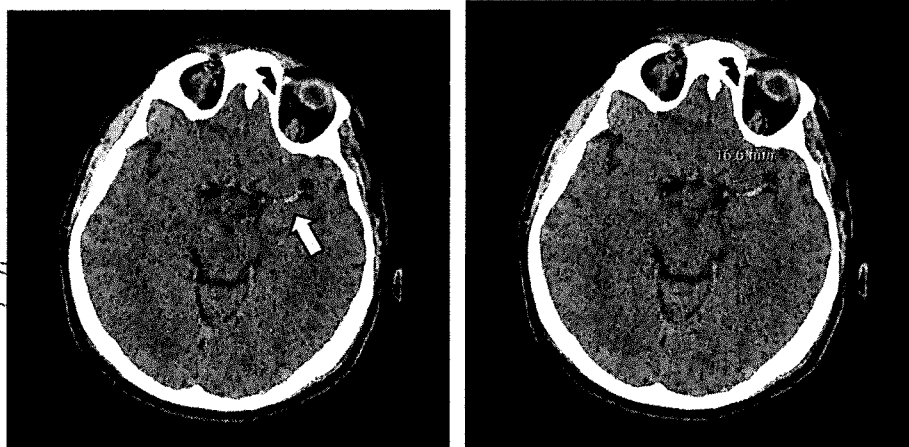
# CATHETER TO THE RESCUE...



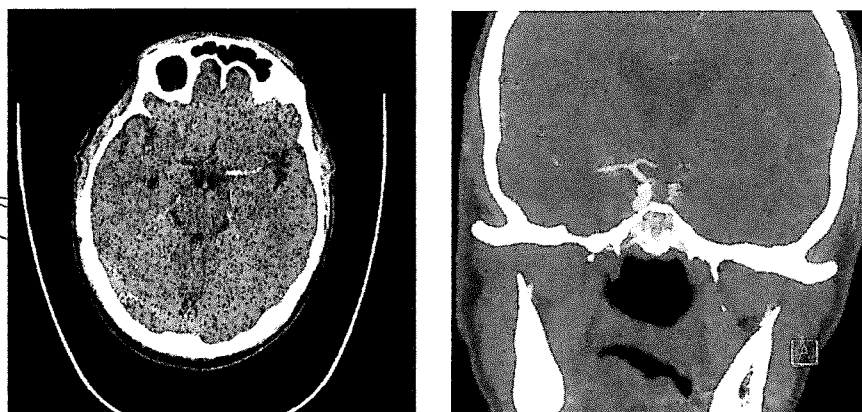
## Mr GC

- 66 yo man, previously well
- 4.10 pm: Sudden collapse with right sided weakness
- 4.55 pm: Arrived ED
  - Aphasic, right hemiplegia, neglect, L eye deviation
  - Dominant TACs, NIHSS 22
  - Projected outcome at 12 months - >95% dead or severe disability
- 5.03 pm: CT and CTA Brain
- Door to CT time is 8 mins

### Mr C: Non-contrast CT

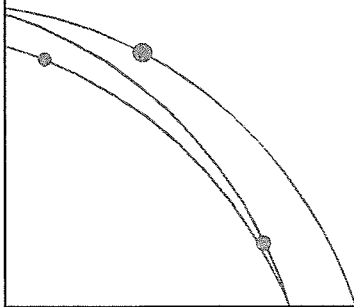


### Mr C : CTA



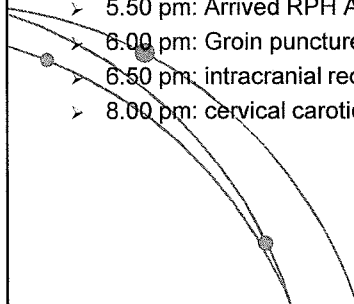
## How likely is Alteplase going to work?

If CTA shows large vessel occlusion TPA will fail in 80% of the time



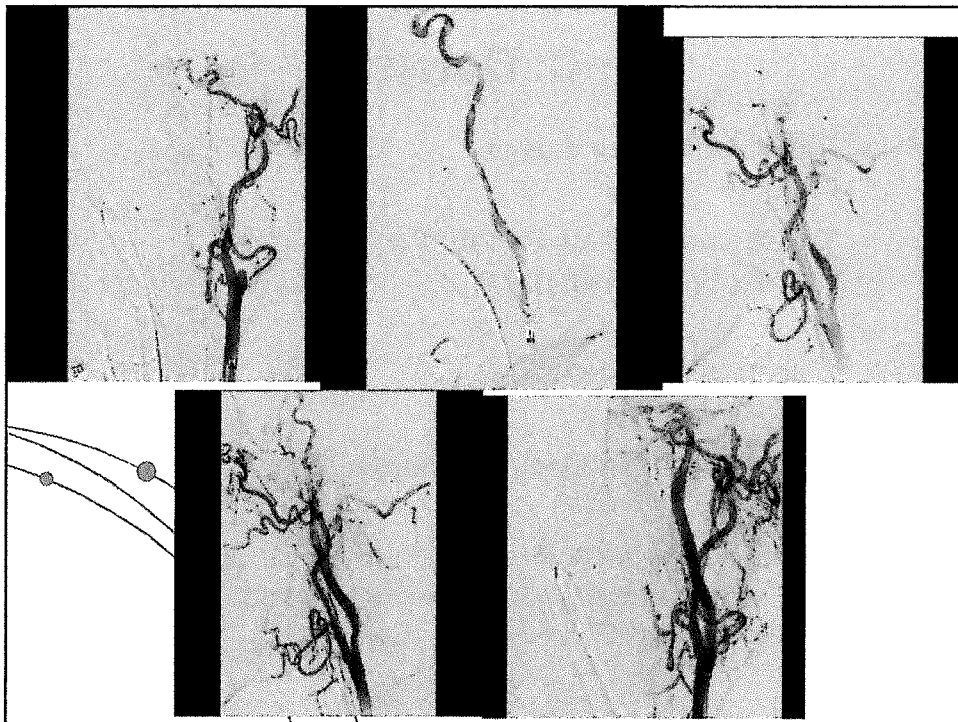
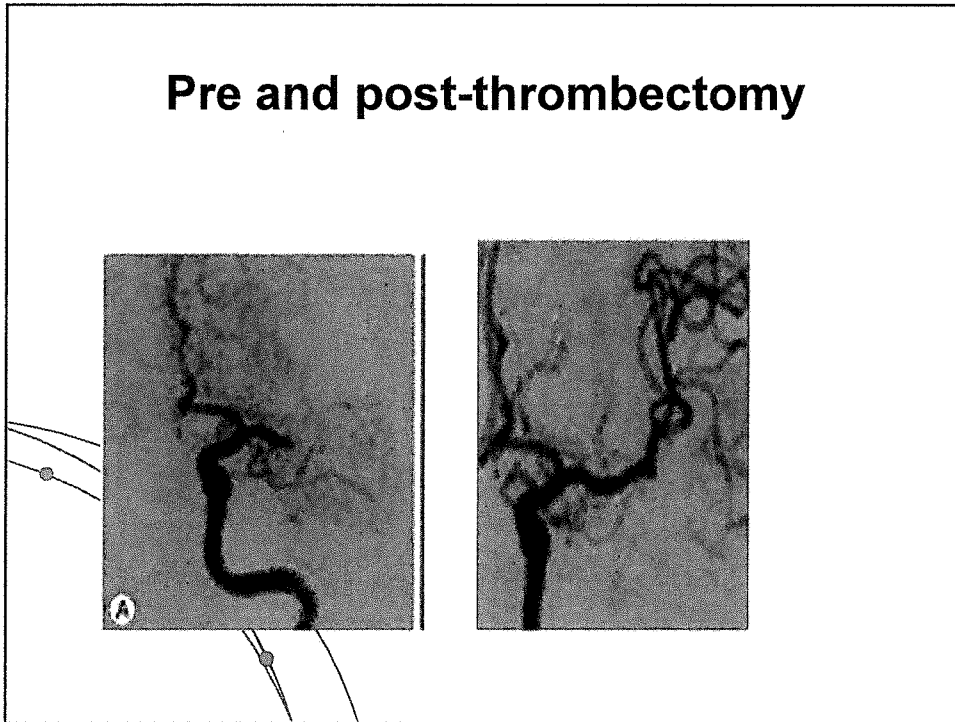
## Mr GC

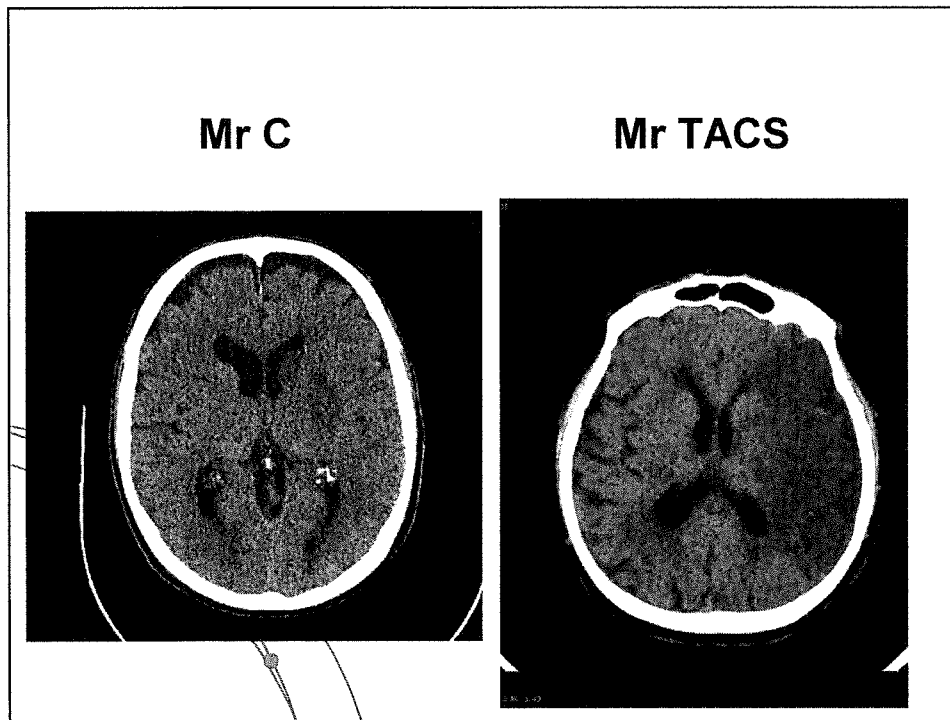
- 66 yo man, previously well
- 4.10 pm: Sudden onset right hemiparesis
- 4.55 pm: Arrived SDH
  - Aphasic, right hemiplegia, neglect, L eye deviation
  - Dominant TACs, NIHSS 22
  - Projected outcome at 12 months - >95% dead or severe disability
- 5.03 pm: CT and CTA Brain
- 5.15 pm: iv Alteplase commenced (Door to needle = 20mins)
- 5.50 pm: Arrived RPH Angio suite
- 6.00 pm: Groin puncture
- 6.50 pm: intracranial recanalization (2 hours 40 mins post ictus)
- 8.00 pm: cervical carotid revascularisation (angioplasty and stent)





## Pre and post-thrombectomy



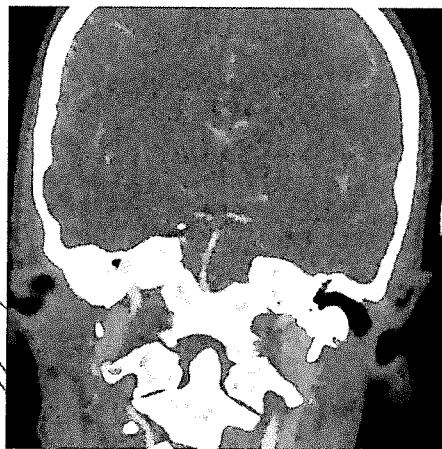


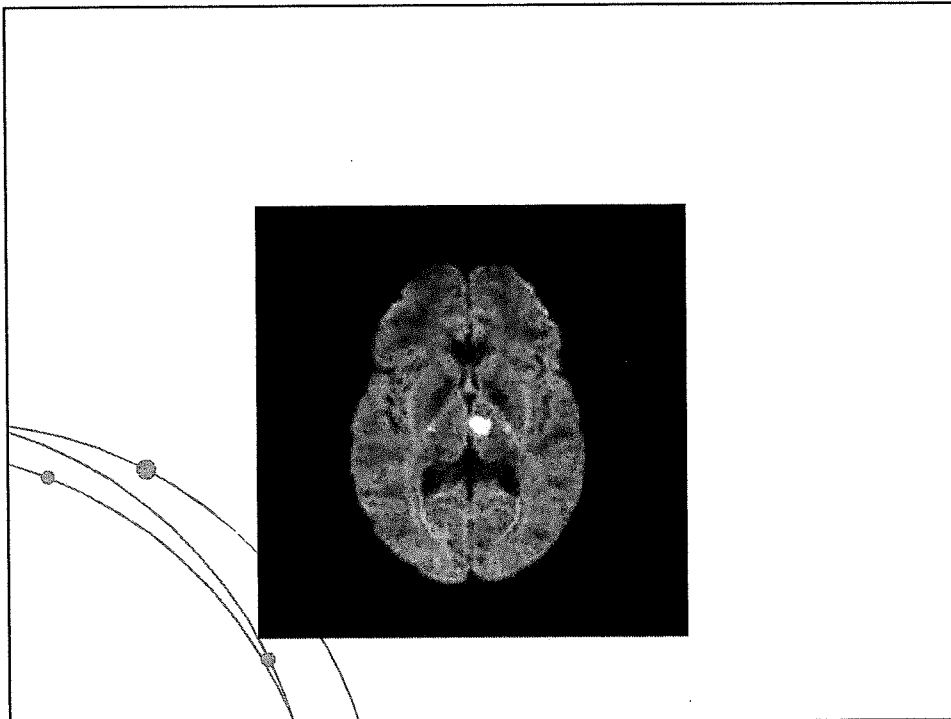
### Mr C: Outcome

- Admitted RPH for 4 days
- Transferred to State Rehab Service, Fiona Stanley Hospital on day 4
- Discharged on Day 8
- No significant neurological deficits
- We know that revascularisation within 2.5 hours of ictus is associated with functional independence (little or no disability) in 91% of patients

## Miss JM

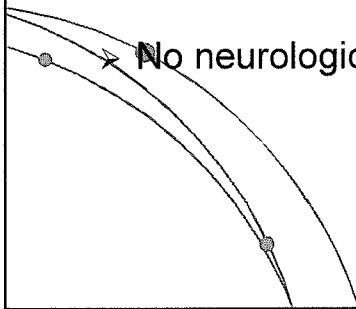
- 22yo woman, fit and well
- 2.45pm: Sudden onset blurred vision, vertigo, nausea and right sided weakness (passenger in the car, returning from gym)
- 4.20pm : Arrive Midland SJOG Hospital
- 4.41pm: CT and CTA brain (door to CT = 21mins)





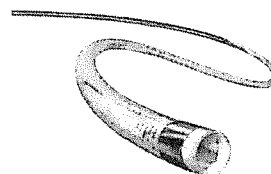
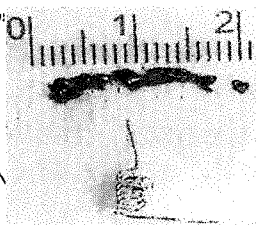
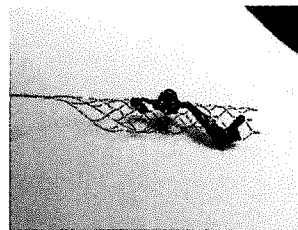
## Miss JM: Outcome

- Transferred back to Midland Day 4
- Discharged Day 10
- No neurological deficit at all



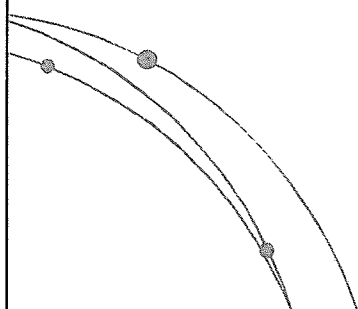
## Thrombectomy or Endovascular clot extraction

- Physical removal of thrombus from cerebral vessel
  - Solitaire
  - ADAPT
  - "Solombra" 01



## What is the evidence?

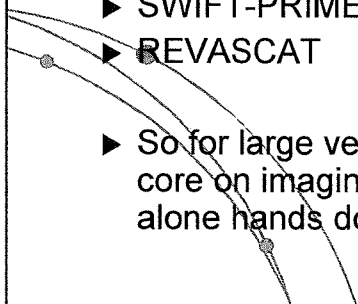
- Five endovascular RCTs published in 2015



## TPA effectiveness in the five new trials

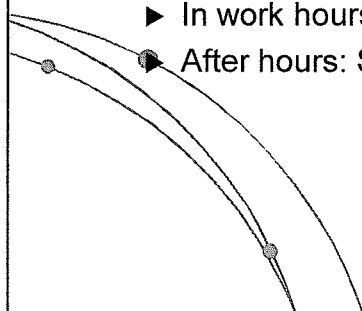
MRS 0-2	TPA	CATHETER
▶ MR Clean	(19%)	32.6%
▶ ESCAPE	(28%)	54%
▶ EXTEND IA	(28%)	74%
▶ SWIFT-PRIME	(20%)	43%
▶ REVASCAT	(28.5%)	45%

- ▶ So for large vessel occlusion, bad stroke, minimal core on imaging treated early catheters beat TPA alone hands down.

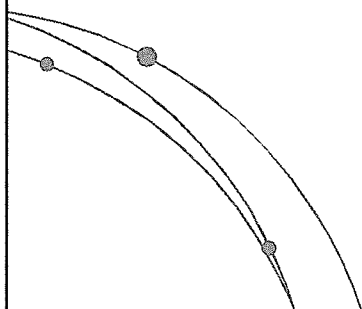


## What is happening in Perth?

- ▶ Thrombolysis
  - ▶ RPH, SCGH, Midland and FSH
  
- ▶ Thrombectomy
  - ▶ Single most exciting new treatment in acute stroke in a very long time
  - ▶ In work hours: SCGH, FSH, RPH
  - ▶ After hours: SCGH

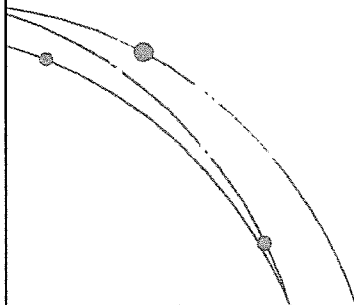


## TIA



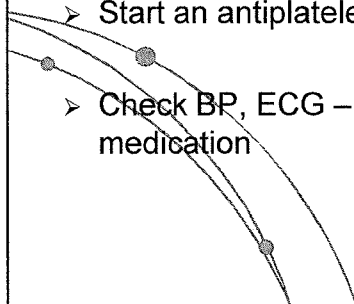
## Risk of stroke following a TIA or minor stroke

BMJ 2004; 328: 326-8



## TIA

- No new updates but basic principles still apply
- CT brain
- Urgent carotid Doppler if anterior circulation syndrome
- Start an antiplatelet and a statin
- Check BP, ECG – decision regarding commencing a BP medication





## Boring stuff, but more important things....

- ▶ Remember management of common things is at least as effective – imagine if we do both well!
- ▶ Stroke Unit care
- ▶ BSL, BP
- ▶ Swallow
- ▶ Fever
- ▶ Nutrition, hydration
- ▶ Prevention of complications
- ▶ REHAB
  - ▶ Bentley
  - ▶ Midland

Absolute benefits of acute stroke therapies in a 1 million population with 2400 strokes/year

	NNT	Proportion treated	N of deaths/dis avoided
Aspirin	85	80%	23
Thrombolysis	15	10%	19
Stroke Unit care	18	80%	107

University of Glasgow

Individual versus population benefit

Intervention	NNT to prevent 1 death	Stroke population (100000)	Patients benefiting (100000)
Aspirin	85	6%	6
Thrombolysis	15	10%	22
Stroke units	18	120%	109

## Take Home Messages

- Time is brain, every minute counts
- Standard imaging for acute stroke is CT/ CTA brain
- For LVO and not much black brain the best management is TPA followed by thrombectomy
- More lives are saved and improved though by Stroke Unit care
- TIA
  - Risk of recurrence
  - Risk stratification
- Rehab

# Thanks!

## ➤ Acknowledgment

- Dr Tim Bates, Midland SJG
- NIIswA

