

Recent advances in the treatment of stroke

Alan Barber

Neurological Foundation of NZ
Professor of Clinical Neurology

Stroke in NZ

- ▶ 9000 new strokes in NZ every year
- ▶ 3rd most common cause of death
 - 1 in 5 die within first month
 - 1 in 2 dead or dependent by 1 year
- ▶ Major cause of long term adult disability
- ▶ Number of strokes increasing

Stroke in NZ

- ▶ Not restricted to the elderly
 - 1 in 4 people with stroke are working age
- ▶ Major problem in Maori/Pacific
 - Age of onset

Maori	56 y
Pacific	60 y
Europeans	73 y

RCT evidence of benefit with:

- ▶ Stroke unit care
- ▶ Ischemic stroke
 - aspirin
 - stroke thrombolysis
 - hemicraniectomy for malignant infarction
- ▶ Intracerebral hemorrhage
 - acute systolic BP lowering to 140 mmHg

Stroke unit care

- ▶ Stroke unit
 - geographically discrete area
 - comprehensive assessments
 - coordinated multidisciplinary care
- ▶ Stroke units reduce death or disability
 - overwhelming evidence (31 RCTs)
 - OR 0.82 (95% CI 0.73–0.92)
 - NNT = 16

Aspirin acutely

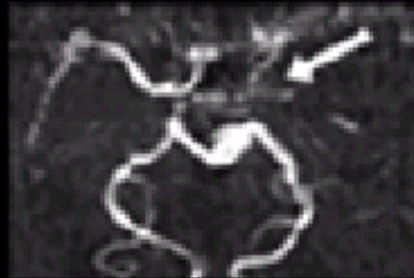
In ischemic stroke

- ▶ Aspirin 150–300 mg within 48 hours
 - modest reduction in death or disability
 - number needed to treat = 79 (12 RCTs)

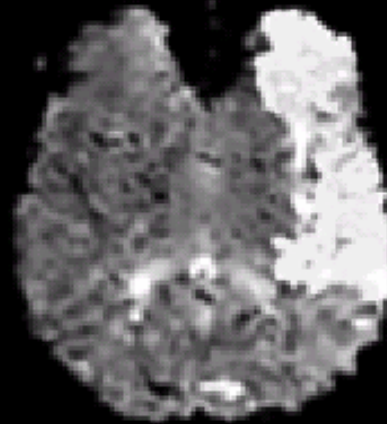
Stroke thrombolysis

Before tPA

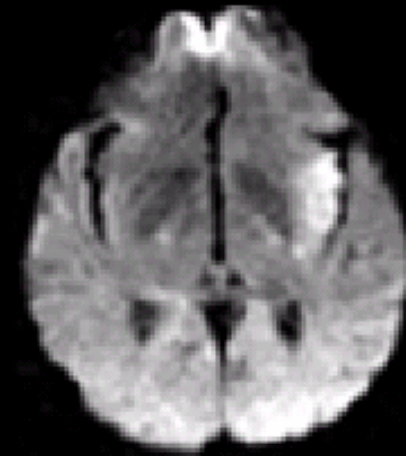
2 h



MRA



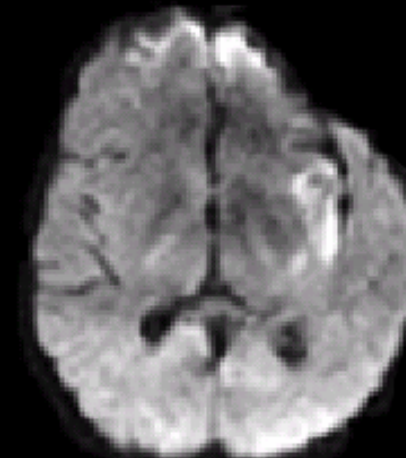
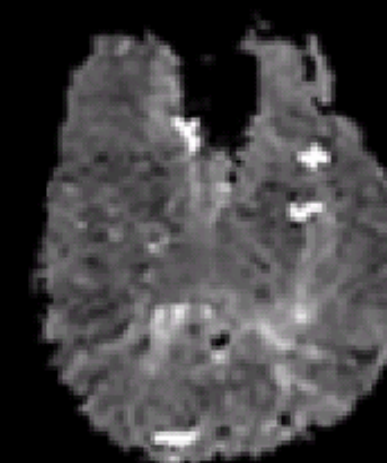
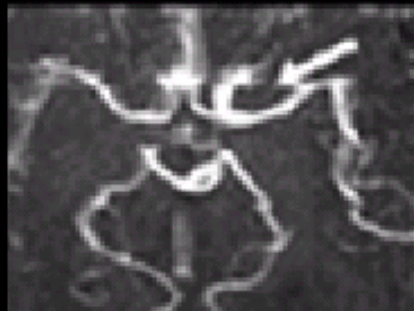
PWI



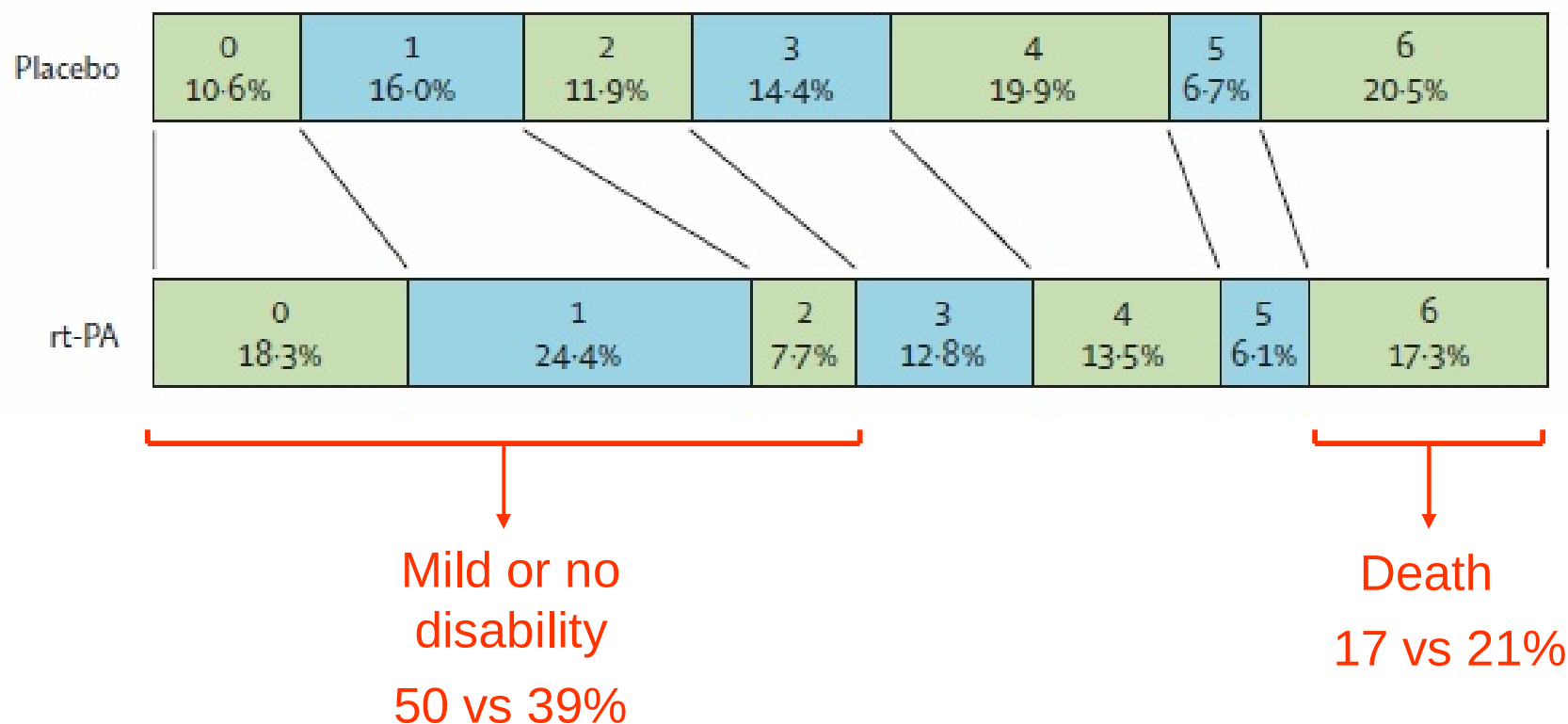
DWI

After tPA

5 d



Modified Rankin score



Time is brain!

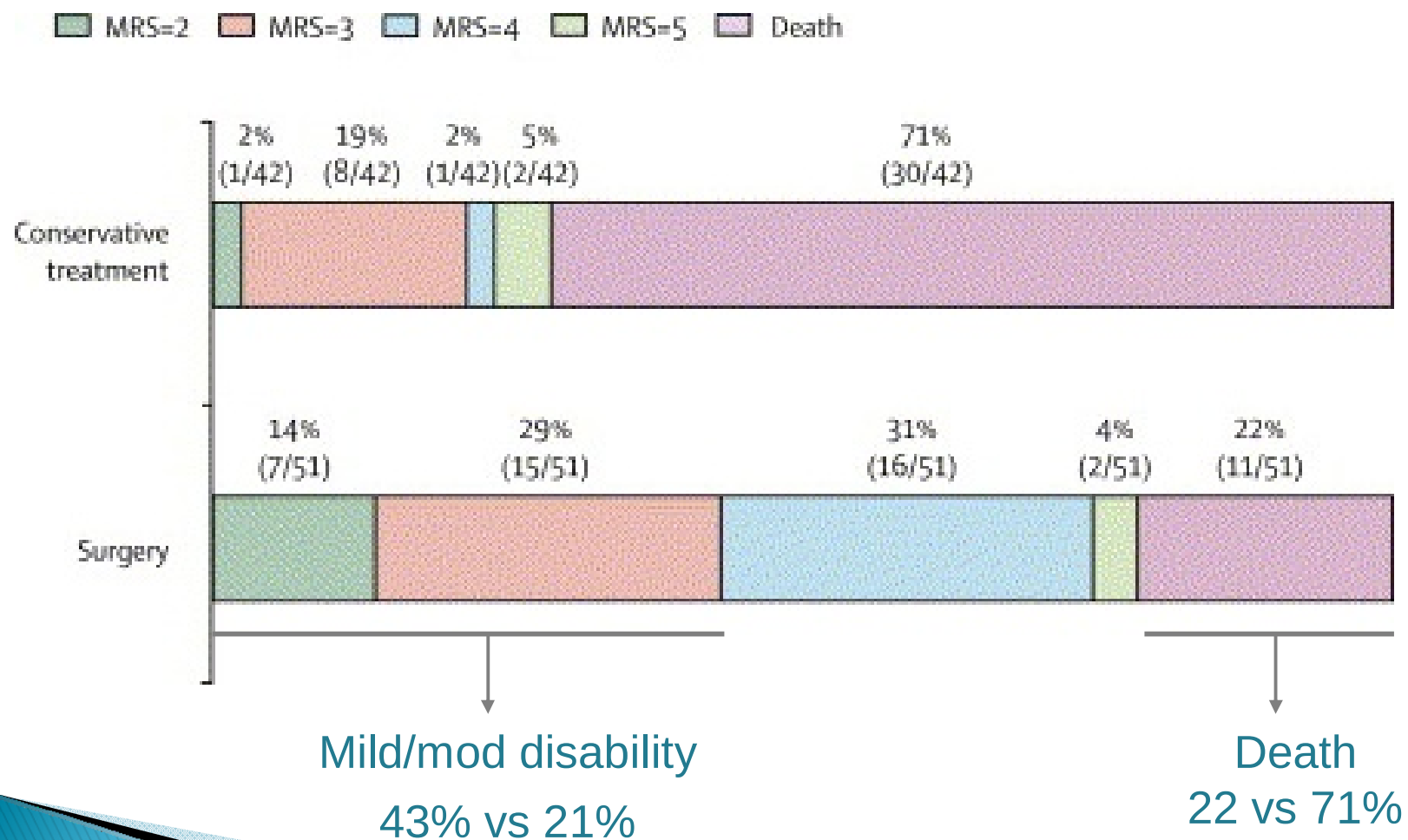
- ▶ NNT to see benefit

- < 1 hr 3
- < 3 hrs 7
- < 3–4.5 hrs 14

Recanalisation with iv tPA

Occlusion	Recanalisation
ICA	5%
MCA	30%
Basilar	11%
Overall	30%

Modified Rankin score



After hemicraniectomy

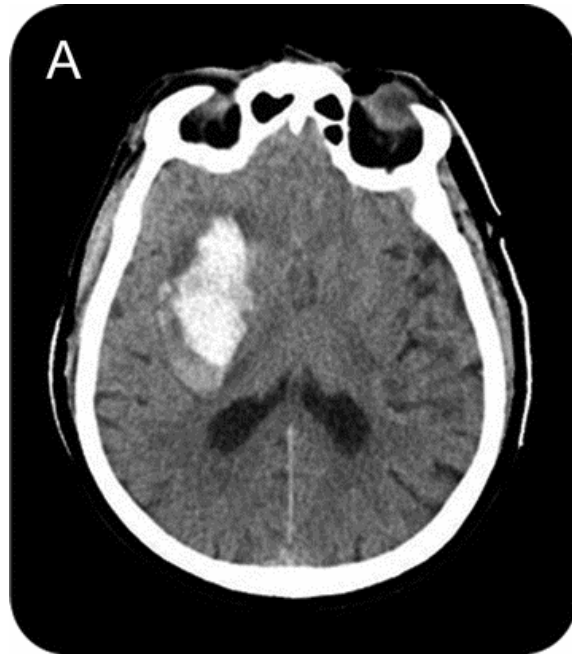
- ▶ NNT = 2 to survive
- ▶ NNT = 4 to survive with mRS of ≤ 3

Lancet Neurol. 2007;6:200

Intracerebral hemorrhage

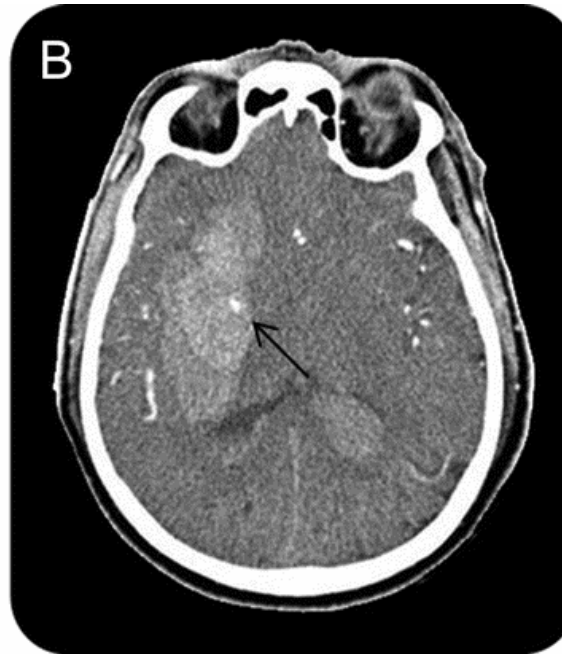
Spot sign & ICH growth

CT



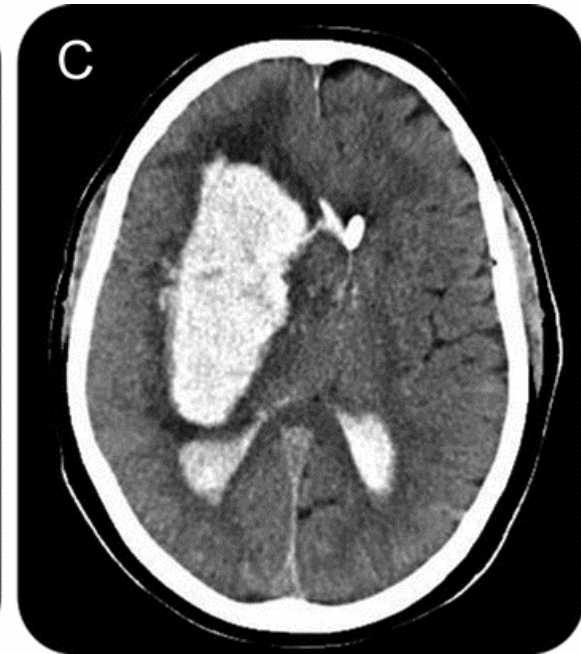
1 hour

CTA



1 hour 10 mins

CT



follow up

Aggressive acute BP lowering

INTERACT II study

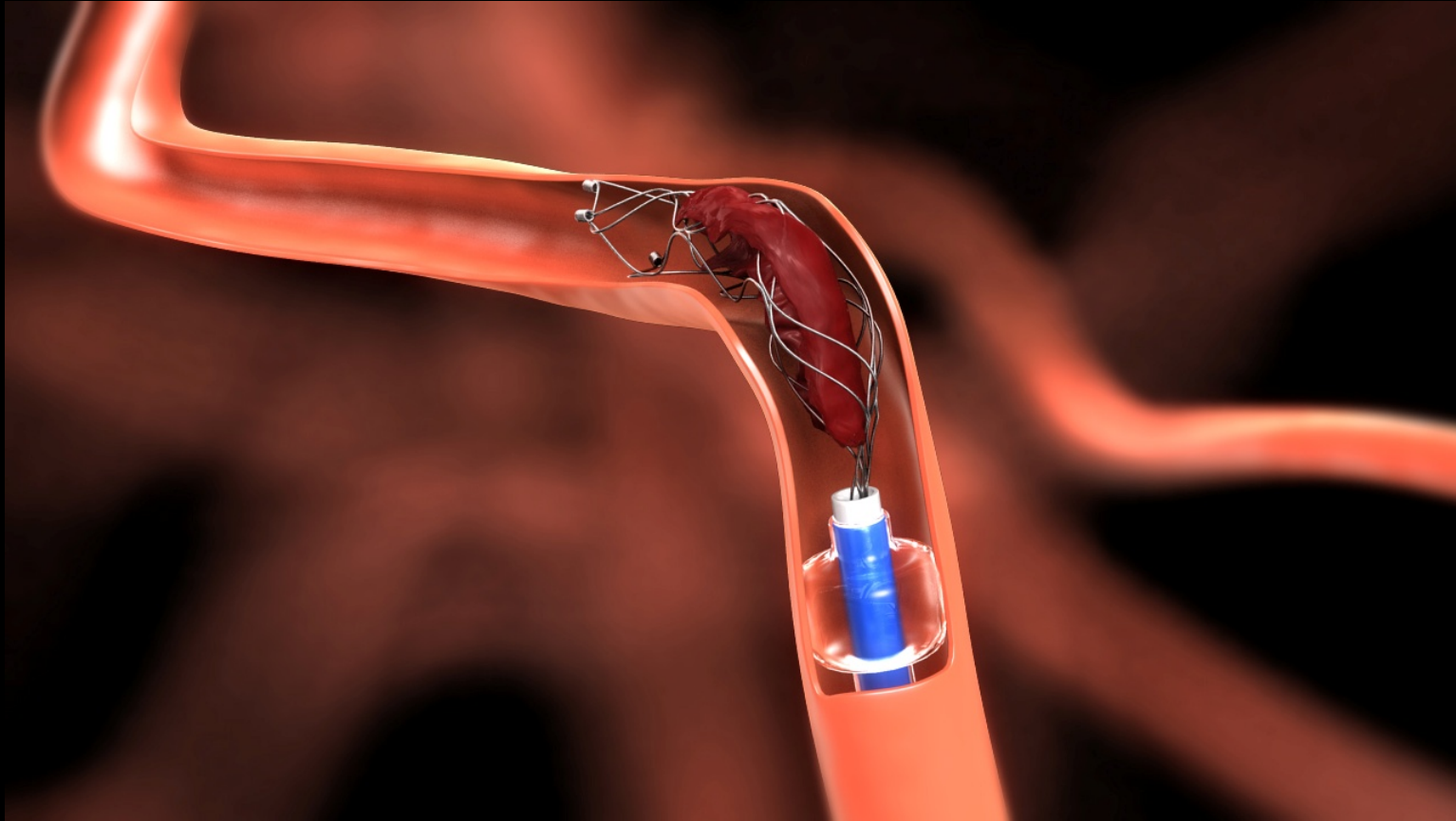
- ▶ 2839 patients <6 hrs
 - <140 mmHg
 - <180 mmHg
- ▶ Aggressive BP lowering improved outcome
 - OR 0.87 (95% CI 0.75–1.01)
 - NNT to prevent 1 death or disability = 27

Future stroke therapies?

Recanalisation with iv tPA

Occlusion	Recanalisation
ICA	5%
MCA	30%
Basilar	11%
Overall	30%

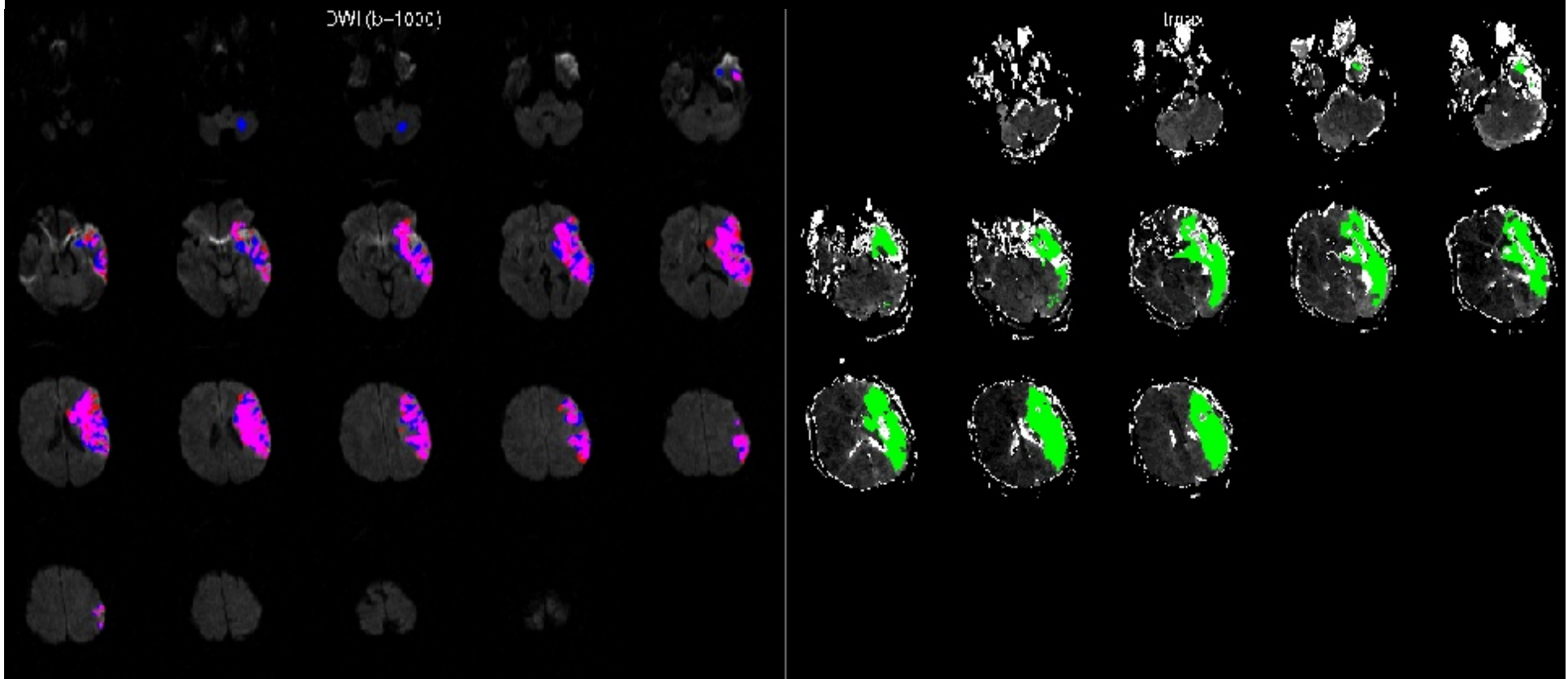
Solitaire device



Extending thrombolysis window

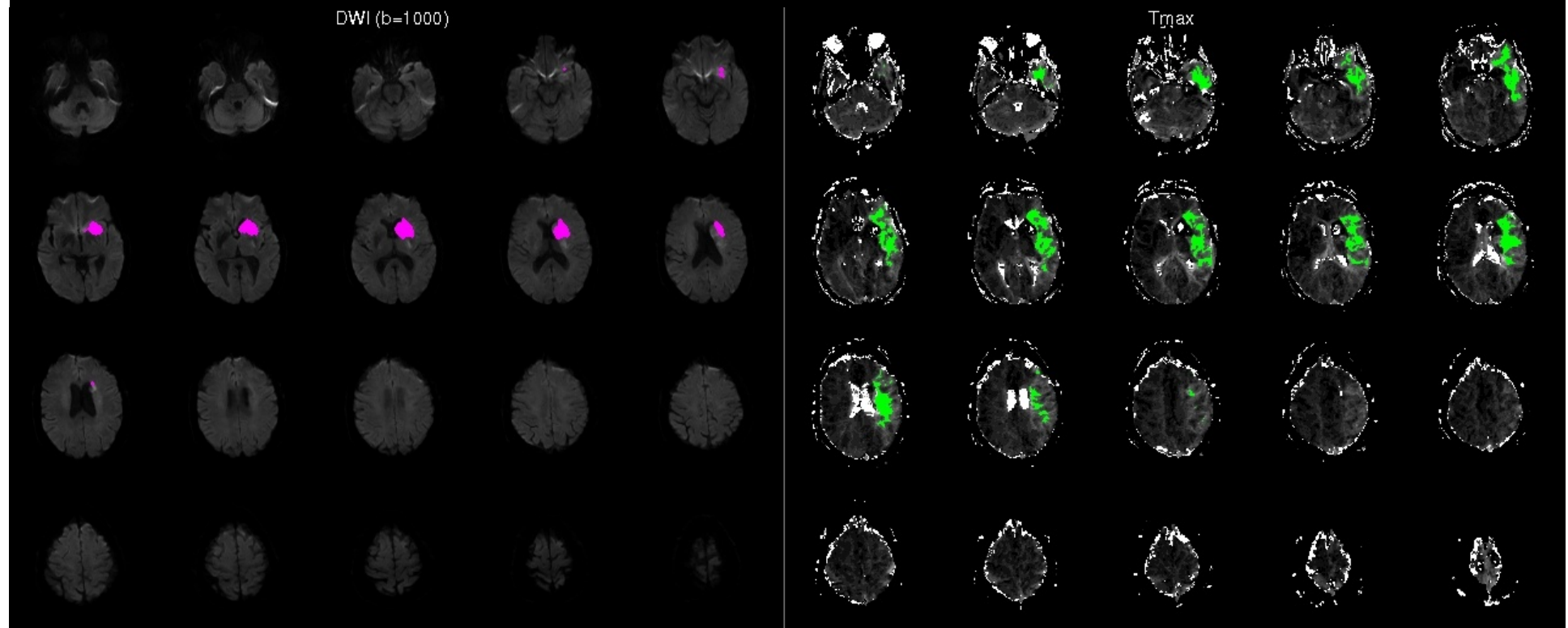
- ▶ **EXTEND IA study**
 - ischemic stroke patients 4.5–9 hrs
 - ‘penumbra’ on CT perfusion or MRI
 - randomised to alteplase or placebo

Don't randomize patient



PWI lesion for $t_{max} > 6.0s$: 137.2 ccm
DWI lesion (total): 129.7 ccm, mismatch ratio: 1.1

Randomize patient



DWI lesion: 11 ml PWI (T_{max}>6s) lesion: 43 ml
Mismatch ratio: 4.0 Absolute Mismatch Difference: 32 ml
Mismatch > 1.2: YES
Absolute mismatch > 10 ml: YES
DWI < 70 ml: YES
Randomize patient: YES

Alternative stroke thrombolytics

Tenecteplase vs alteplase

▶ Phase II study

- better imaging outcomes
- trend to reduced death/disability (mRS 5/6)
- suggestion of improved functional outcome
- trend to reduced ICH

▶ TASTE Phase III study

- 'penumbra' on CT perfusion or MRI
- randomised to tenecteplase or alteplase

Acute therapy summary

- ▶ Stroke units
- ▶ Ischemic stroke patients
 - aspirin acutely
 - stroke thrombolysis
 - hemicraniectomy
- ▶ Intracerebral hemorrhage
 - aggressive acute BP management