Clinical Trial(s) Testing Stroke Imaging:
PRACTISE and **PISTE-2**

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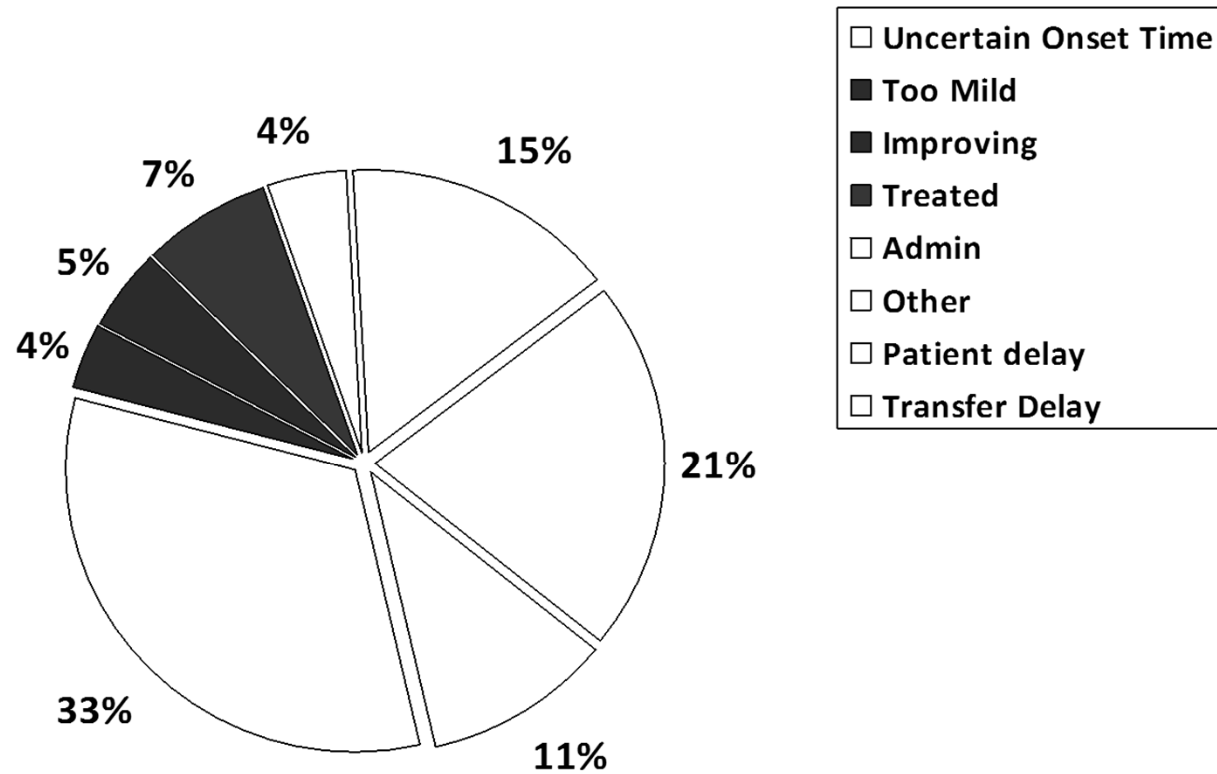
Disclosures

- Chief investigator for PRACTISE and PISTE trials
- Institutional support for these trials from
  - The Stroke Association
  - National Institute for Health Research (NIHR)
  - Health Technology Assessment (HTA)
- Unrestricted (and modest) support for PISTE start-up phase from
  - Codman
  - Covidien

Why Are Patients Not Treated with IV rtPA?

Clinical Anxiety:
Are these patients bad enough to warrant any risk?



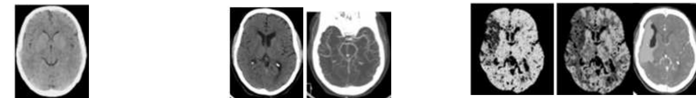
Barber et al *Neurology* 2001;56;1015-1020

"Too Mild to Treat": Outcomes

Reasons for exclusion	n	Median NIHSS	Dependent at discharge or died during admission
Too mild	**41**	**3**	**7 (17%)**
Clinical improvement	**57**	**6**	**25 (44%)**
Either	**98**		**33%**

Barber et al. *Neurology* 2001;56:1015–1020

Multimodal CT Improves Diagnostic Sensitivity

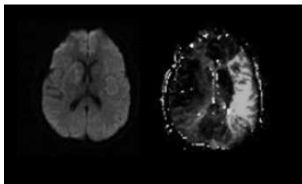


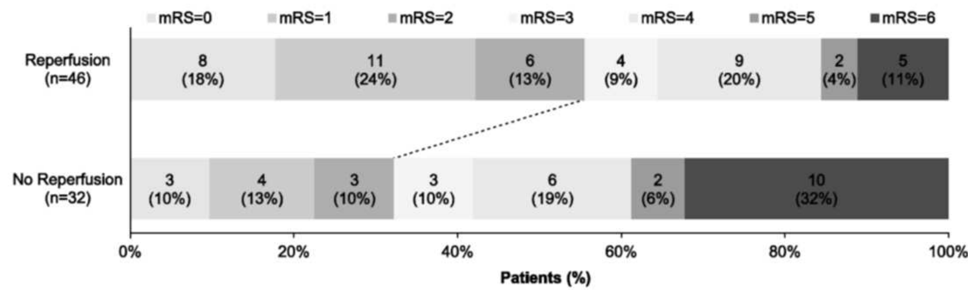
Sensitivity	NCCT	NCCT+CTA	CTP
All (n=277)	47%	58%	80%
Mild / Improving (NIHSS <8) (n=115)	19%	24%	63%

- All suspected stroke <9h after onset or waking with symptoms, after clinical assessment by specialist stroke team

Campbell et al. *J Neurol Neurosurg Psychiatry* 2013 84: 613-618.

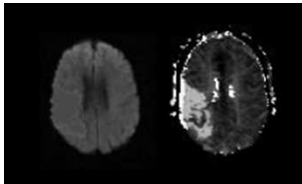
DEFUSE-2: Mismatch Associated with Better Outcome in Late Reperfusion

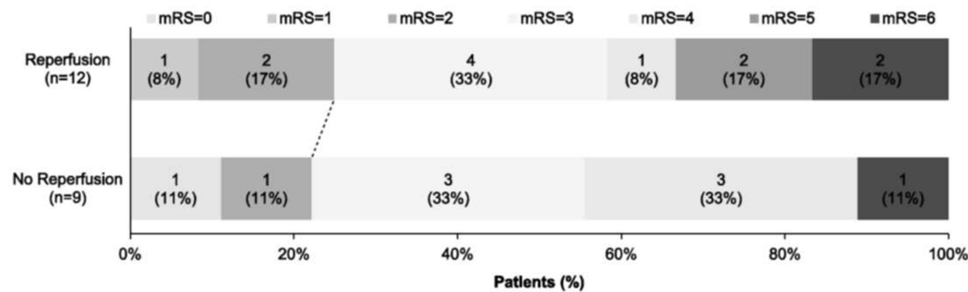




OR for Favourable Outcome*

8·5 (95% CI 2·6 – 28)



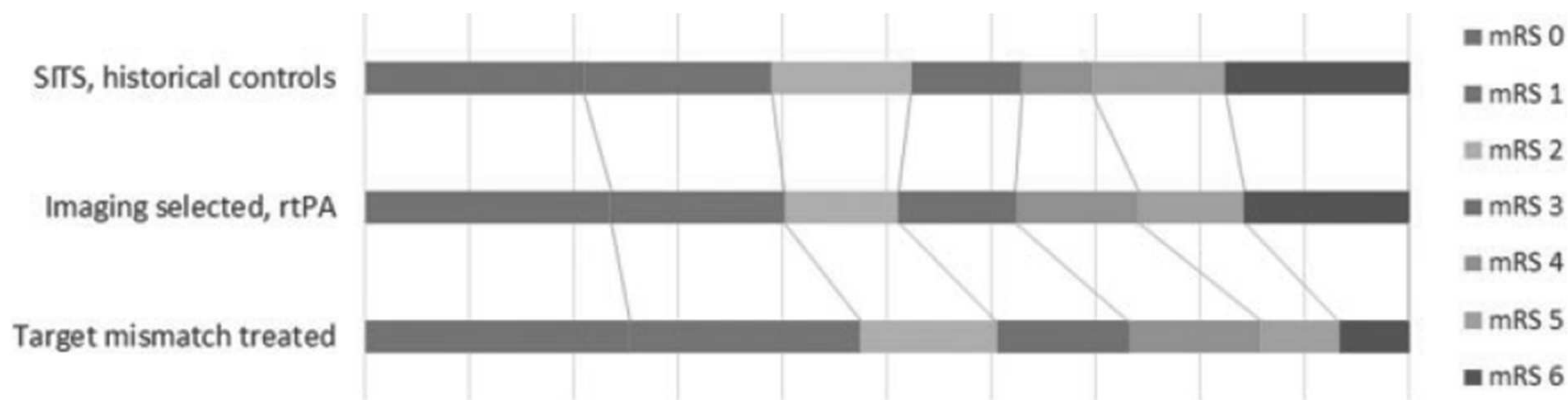


0·2 (95% CI 0·0 – 1·6)

*** Adjusted for age and baseline DWI volume**

Lansberg et al *Lancet Neurol* 2012

Outcomes Compared to Historical Data: CTP Selection



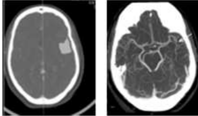
Outcome	Visual CTP Selected	Offline CTP Selected
d90 mRS 0-1	**1.59** (1.12-2.23)	**2.11** (1.45-3.06)
SICH	**1.38** (0.65-2.92)	**0.56** (0.19-1.66)
Death	**0.56** (0.35-0.92)	**0.26** (0.14-0.49)

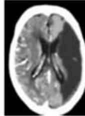
Bivard et al. *Brain* 2015: 138; 1919–1931

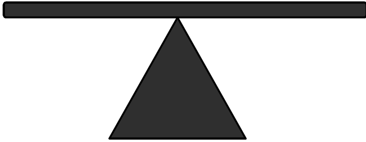
PRACTISE Trial Assumptions

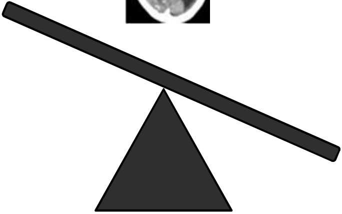
Mild or Improving Symptoms
No clear CT abnormality

Significant Symptoms
No CT contraindication









More Likely to Treat with IVT

Treatment unaffected

Less likely to treat

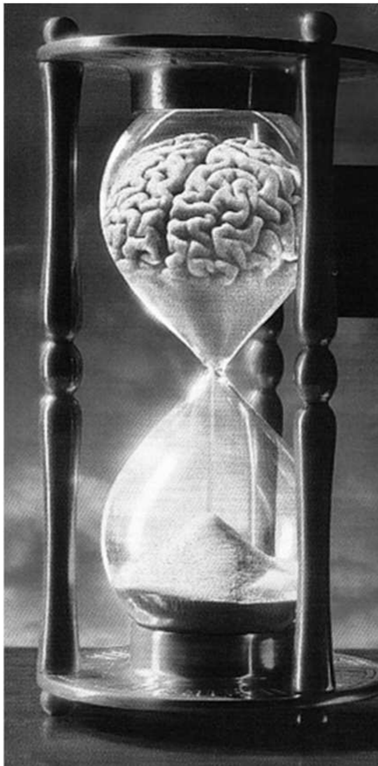
75% of NIHSS<8 have CTA occlusion or CTP deficit

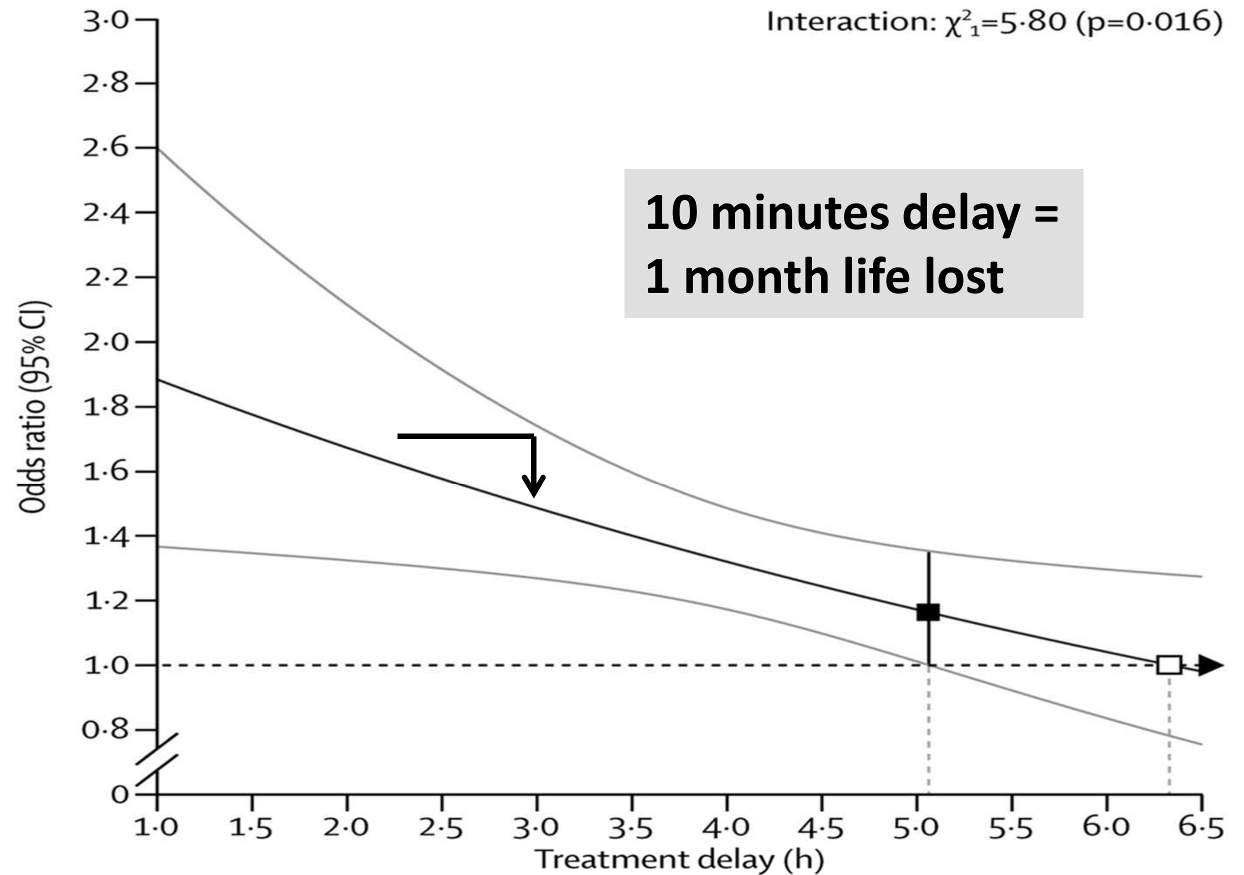
4-10% have CTP “large core”

Ah, but...Time is Brain:

How Long Does the Extra Information take to Acquire?

SINAPSE
Scottish Imaging Network – A Platform for Scientific Excellence

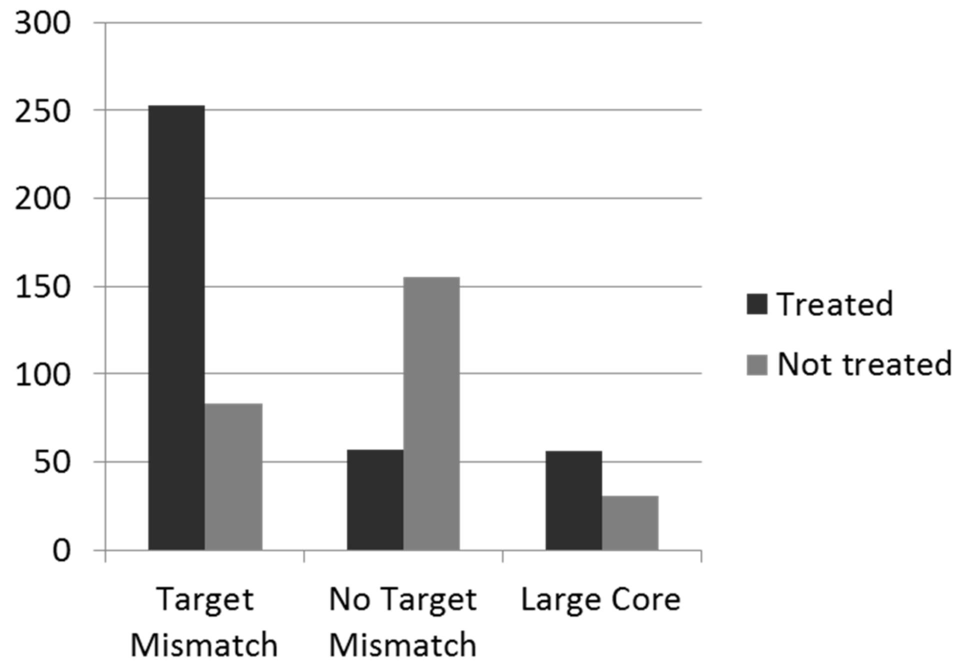


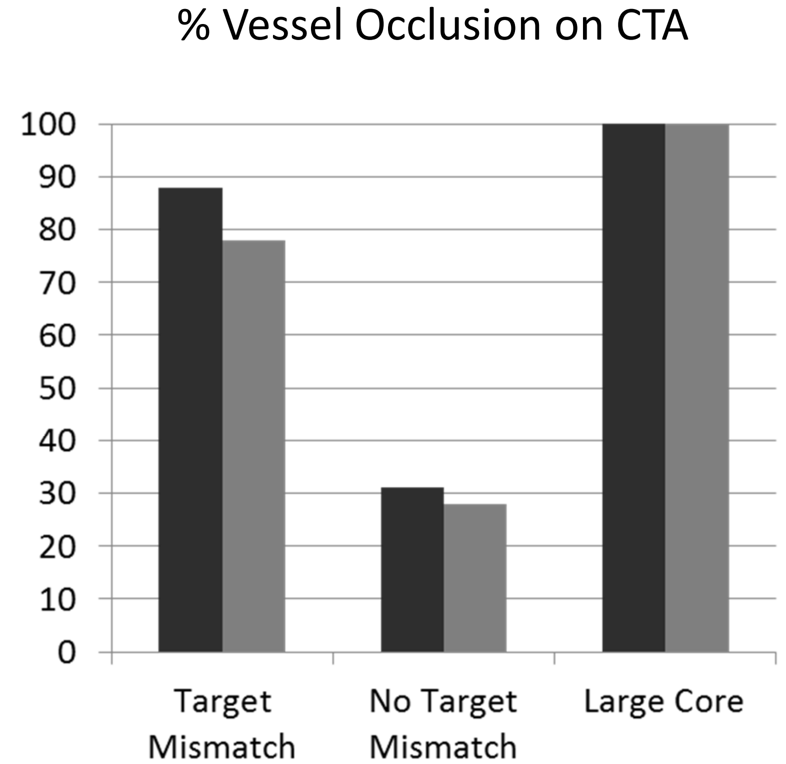


Window	1.5h	1.5-3h	3-4.5h	4.5-6h
NNT	**5**	**9**	**19**	**50**

Emberson et al. *Lancet* 2014;384:1929-35.

Visual Assessment versus Automated

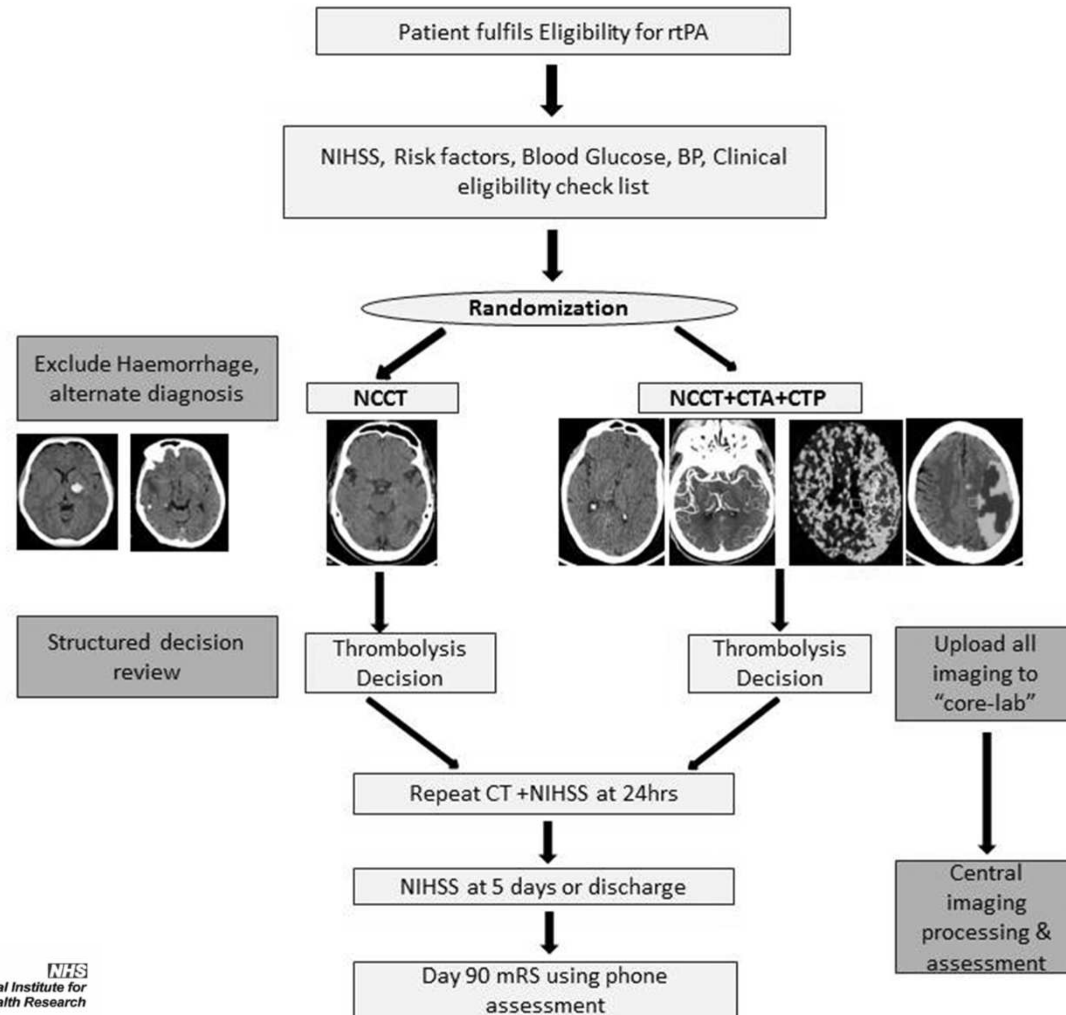




Bivard et al. *Brain* 2015: 138; 1919–1931

Will Better Diagnostic Information Change the Proportion Treated with rtPA (and the outcomes)?

PRACTISE Trial



PISTE-2: A trial of Perfusion Imaging for Thrombectomy Selection

IV rtPA Eligible <4.5h

CT suitable for IAT and CTA LAO (ICA, M1, single M2)

R

Additional CTP with automated analysis

Proceed to thrombectomy directly

No target mismatch

RAPID-defined "Target mismatch"

IAT

Day 90 Outcome mRS

Conclusions

- Observational data suggestive but potentially biased
- Extra information comes at a cost of treatment delay, and may be misinterpreted
- RCTs evaluating imaging selection strategies are feasible *and needed*

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