Tratamientos de reperfusion cerebral en el ictus agudo

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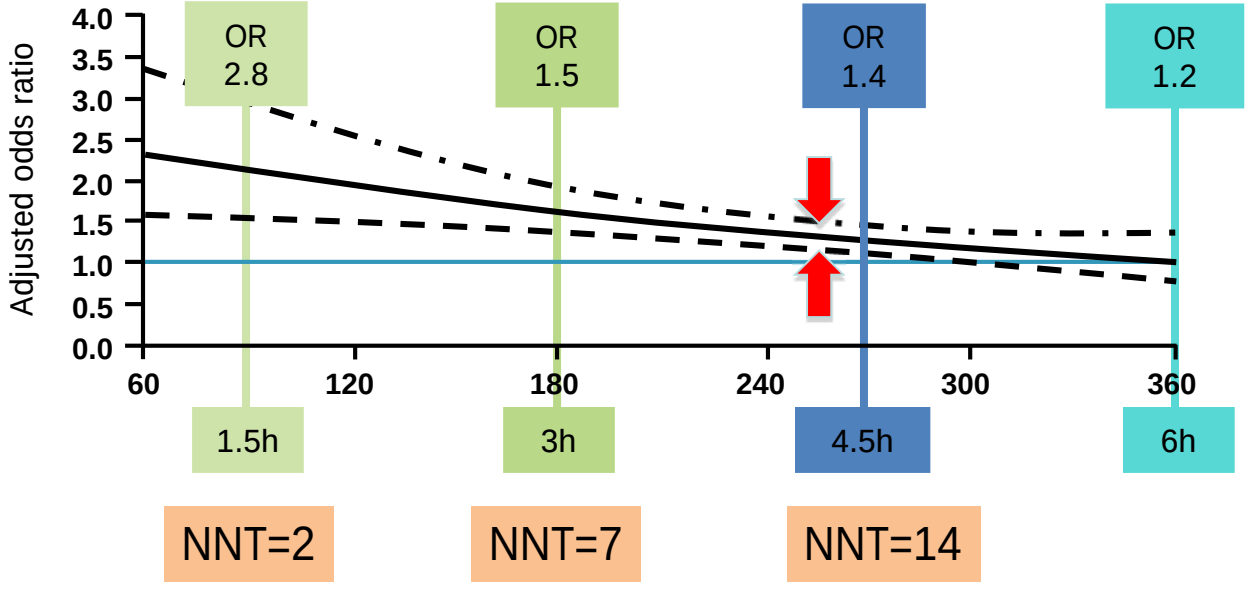
Hospital Vall d´Hebron
Barcelona

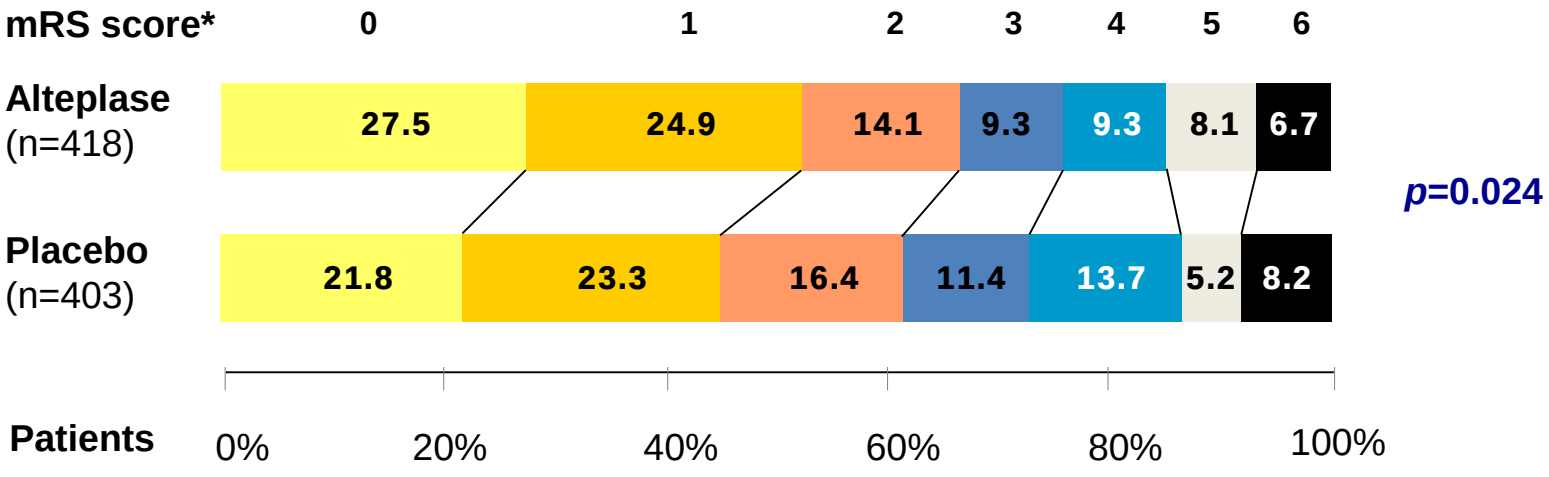
Early treatment remains essential



Time Interval from onset of symptoms to treatment initiation [min]

Hacke et al. Lancet 2004

Distribution (shift) analysis* day 90 (ITT)



*stratified on Cochran–Mantel–Haenszel test,
adjusted for baseline NIHSS scores and time-to-treatment onset

*Lees et al. N Engl J Med 2006;354:588-600

Independent predictors of good outcome after iv tPA

Factor	SE	OR(95%CI)	p
Constant	0.467(0.69)		
Recanalization	1.41 (0.26)	4.11 (2.42-6.95)	<0.001
NIHSS score	-1.03 (0.4)	0.35 (0.16-0.78)	0.0013
ASPECTS value	1.09 (0.49)	2.98 (1.13-7.85)	0.0253
SBP	-1.12 (0.43)	0.32 (0.13-0.76)	0.0116
Proximal occlusion	-1.37 (0.45)	0.25 80.10-0.61)	<0.001

CLOTBUST Collaborators

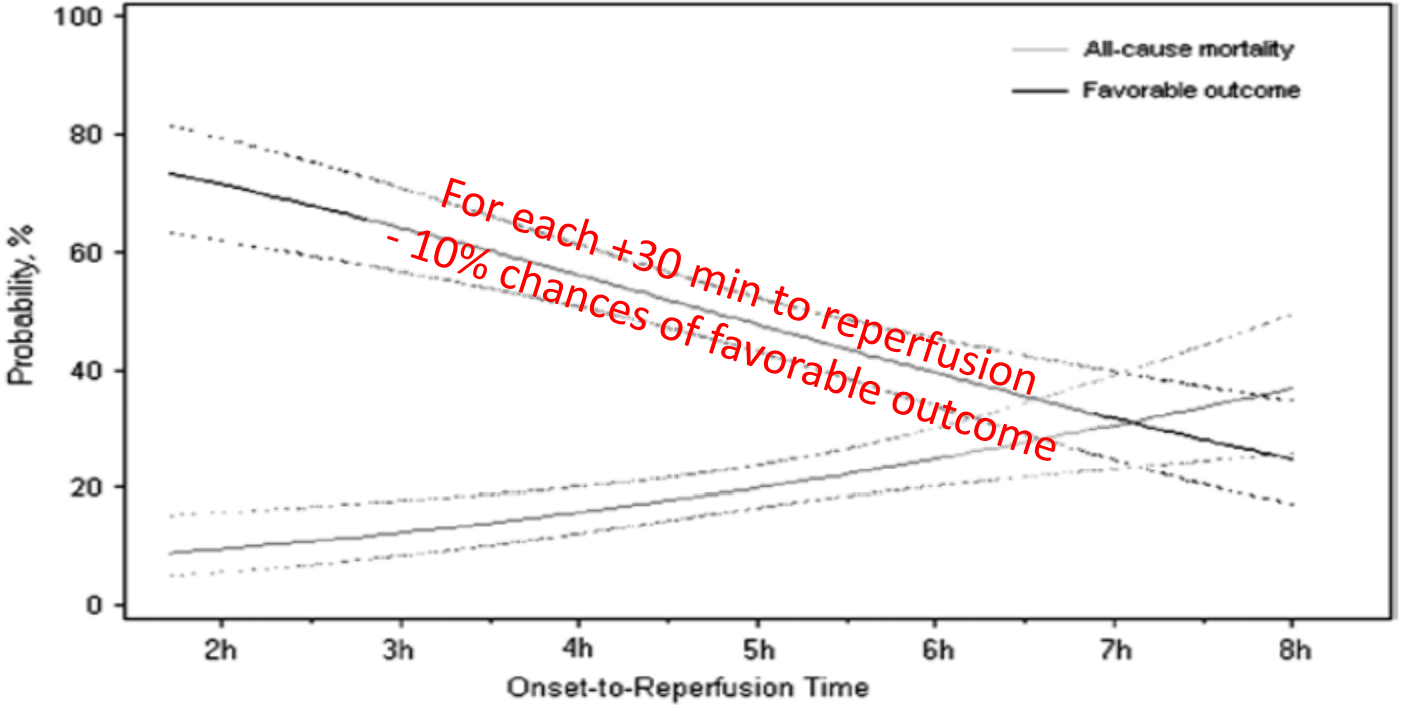
Impact of Onset-to-Reperfusion Time on Stroke Mortality

A Collaborative Pooled Analysis

Mikael Mazighi, MD, PhD; Saqib A. Chaudhry, MD; Marc Ribo, MD; Pooja Khatri, MD, MSc; David Skoloudik, MD; Maxim Mokin, MD; Julien Labreuche, BST; Elena Meseguer, MD; Sharon D. Yeatts, PhD; Adnan H. Siddiqui, MD; Joseph Broderick, MD; Carlos A. Molina, MD; Adnan I. Qureshi, MD; Pierre Amarenco, MD

(*Circulation.* 2013;127:1980-1985.)

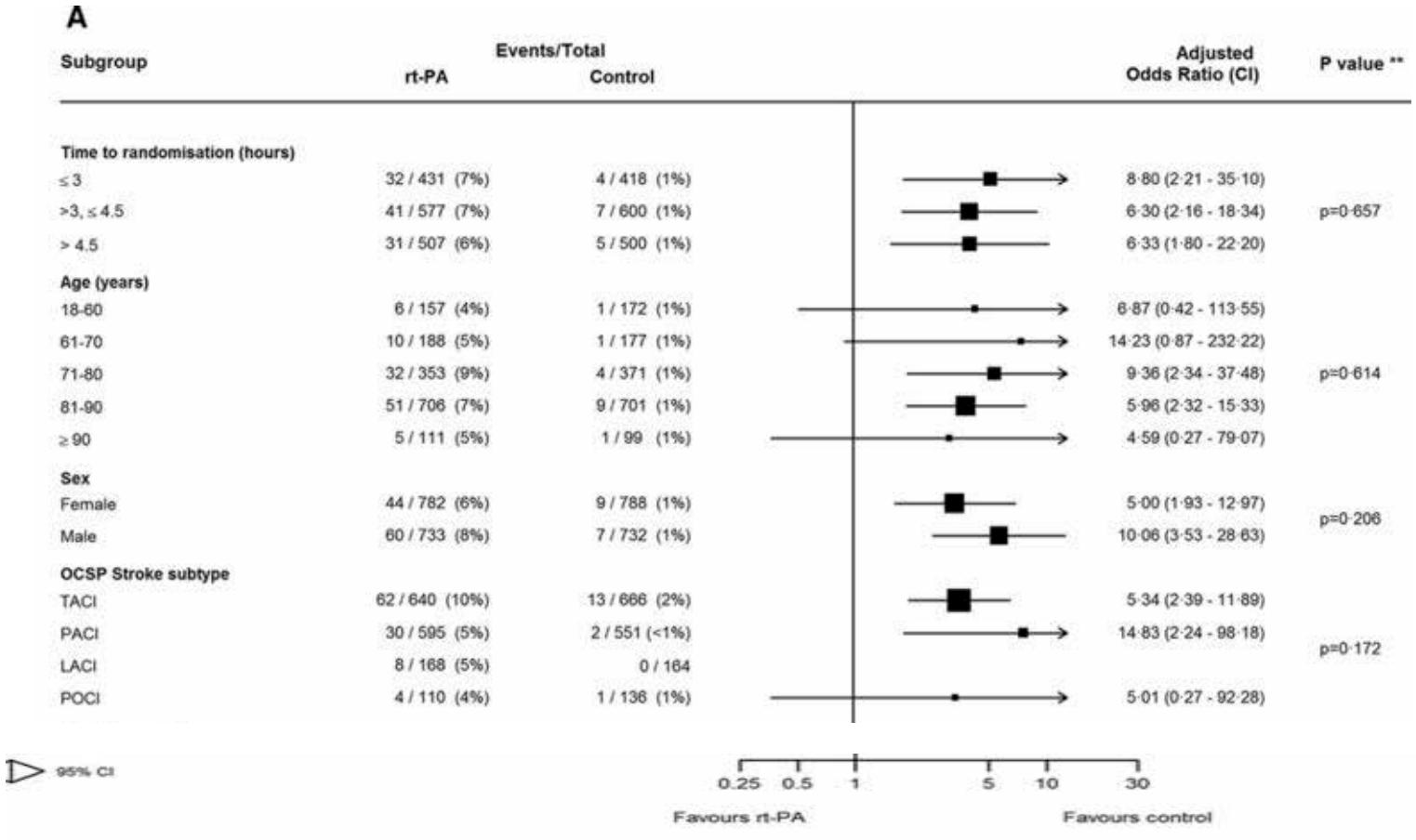
480 patients with endovascular treatment & known time of reperfusion



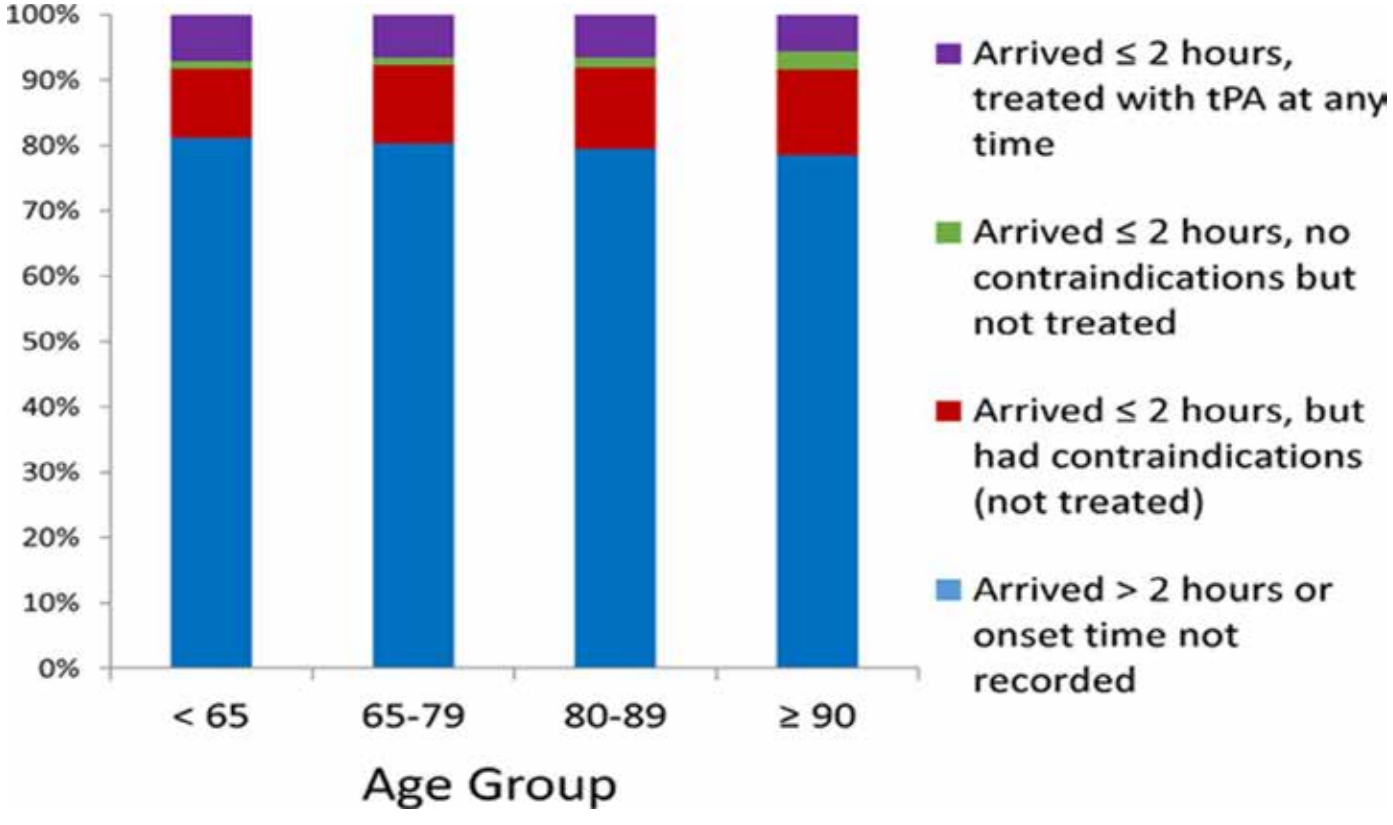
Unresolved issues in intravenous thrombolysis

- Treatment of the minor or most severe strokes (NIHSS ≥ 25)
- Treatment in prior anticoagulant/antiplatelet therapy
- Management of hypertension
- Prediction and treatment of the hemorrhagic risk
- Treatment in patients older than 80 years
- Treatment beyond 4.5 hours in patients with salvageable brain

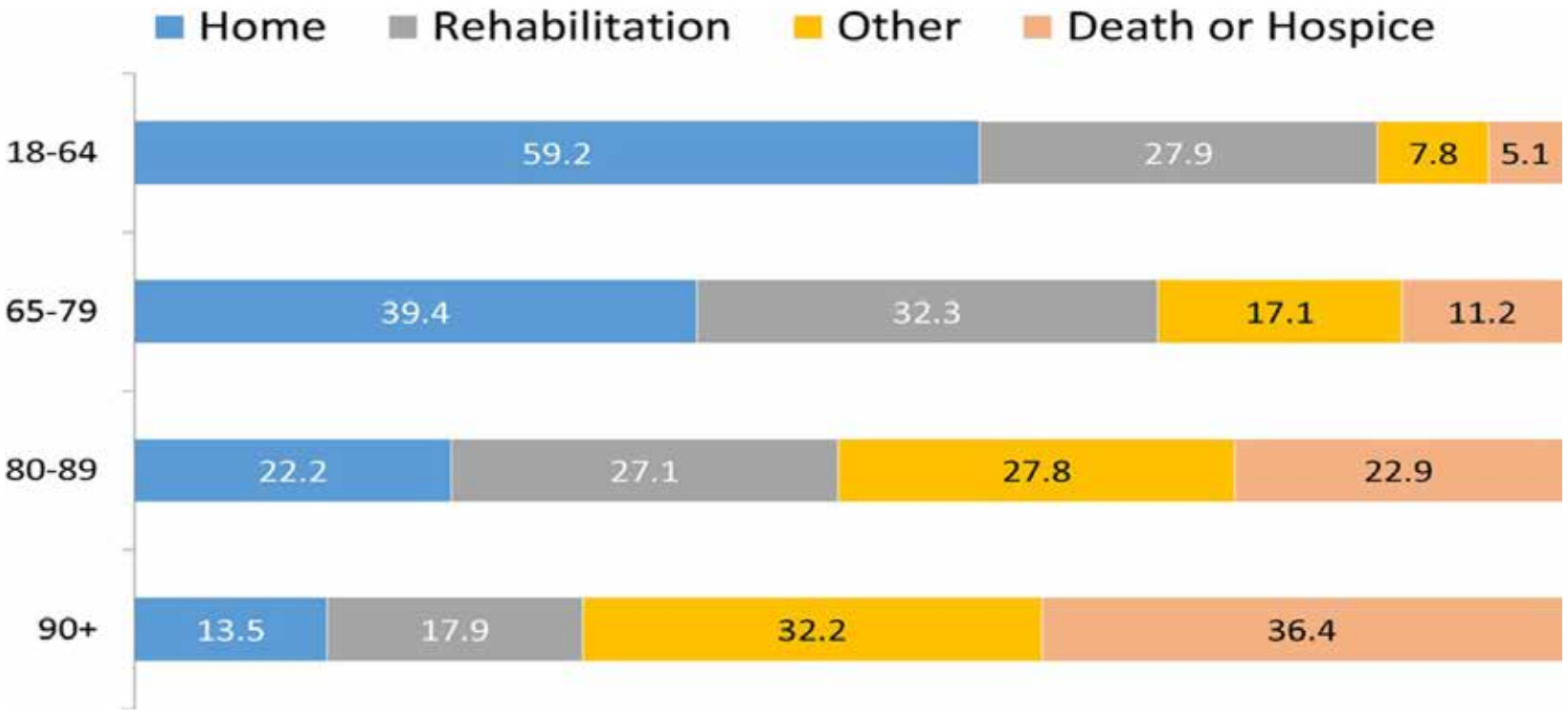
Risk of ICH after tPA inIST-3 Trial



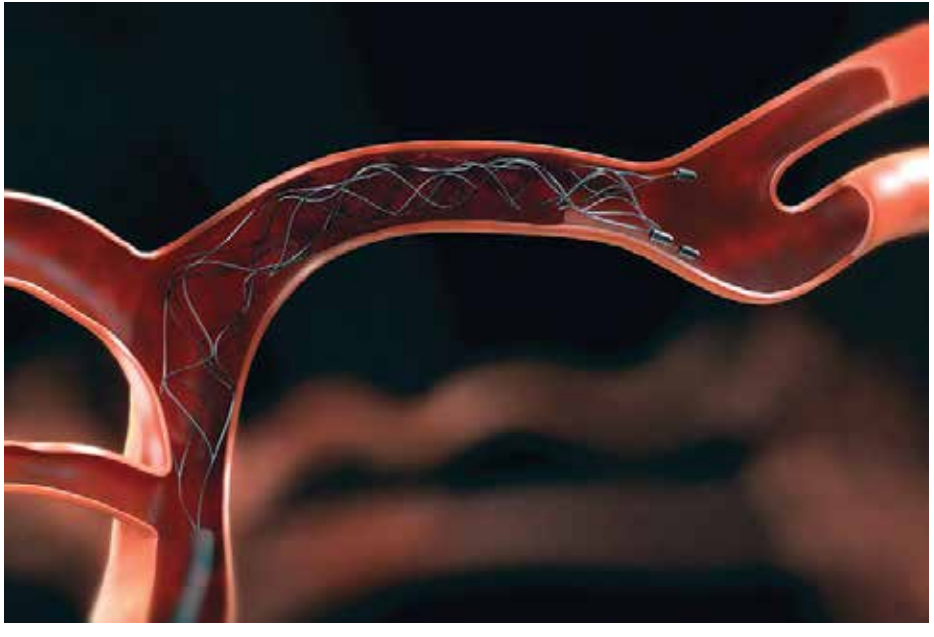
Rate of tPA therapy according to age

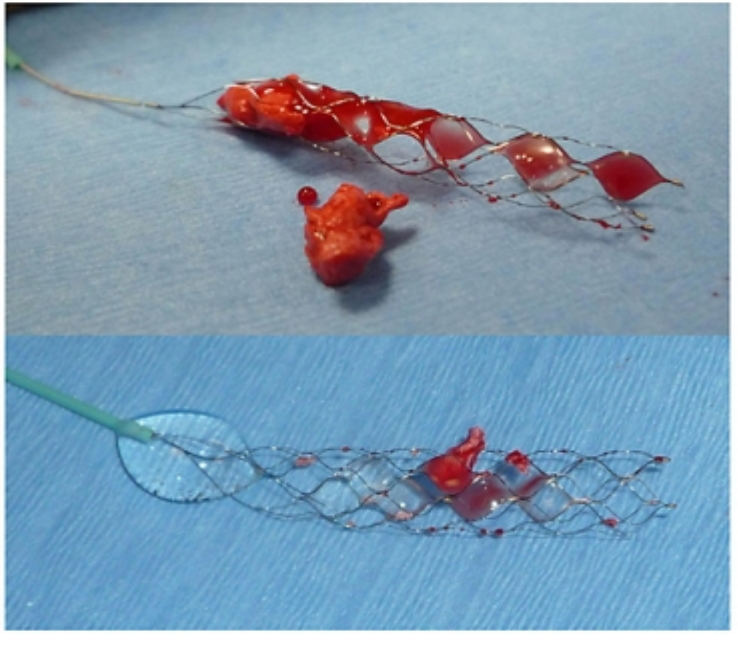


Destination after stroke according to age



Temporary endovascular bypass and clot retriever Solitaire™

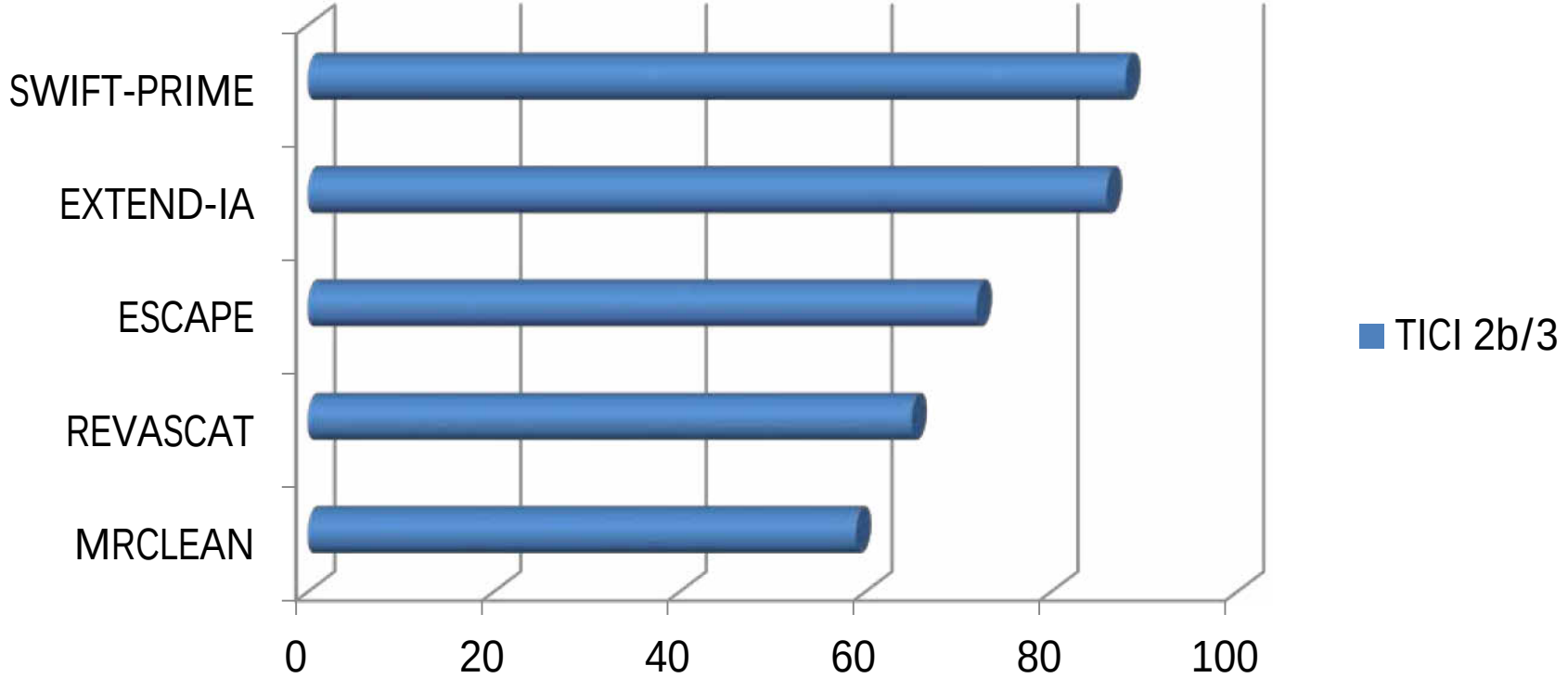




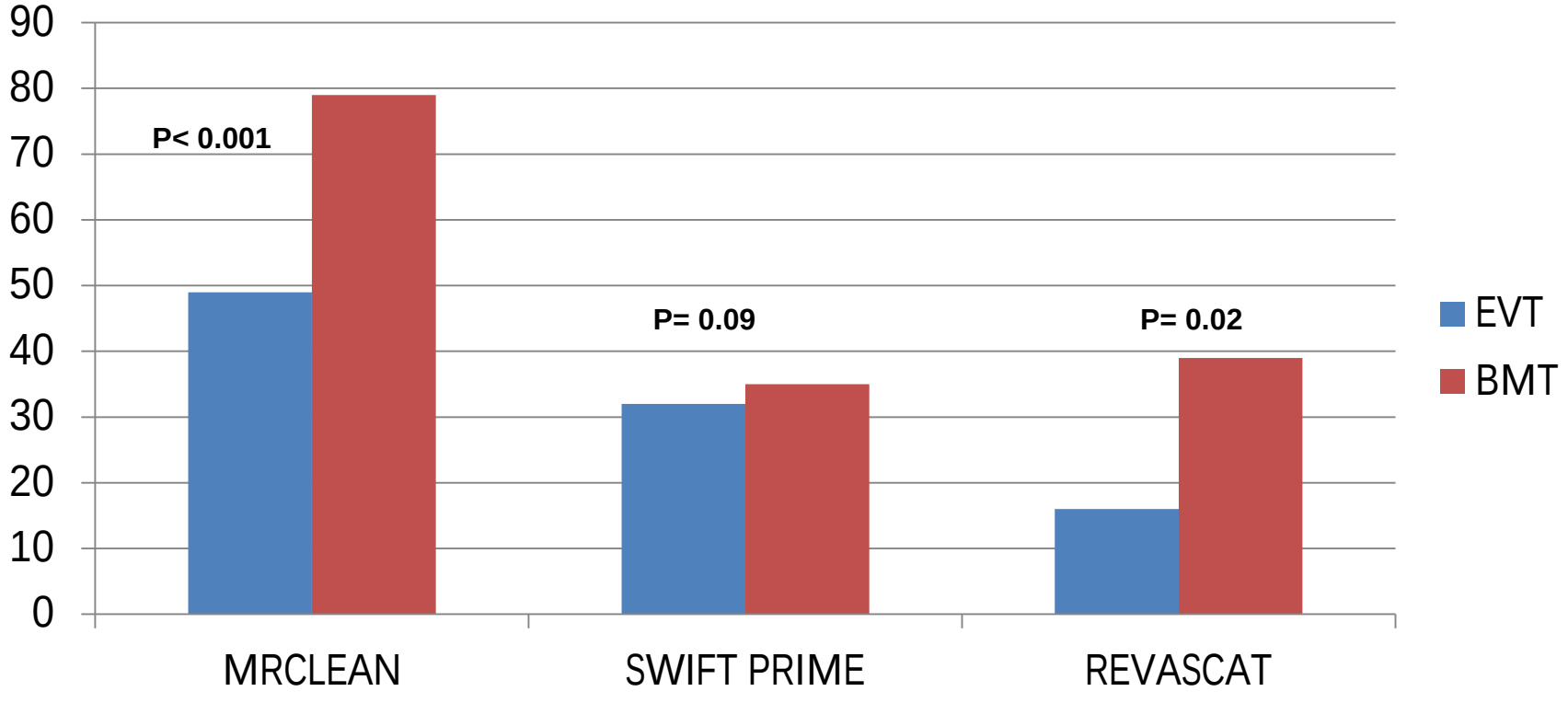
Recent stroke thrombectomy trials

trial	Design	Time window	Imaging selection	LVO	tPA
MR CLEAN	(NL), EVT vs SC	<6 hours	CT ASPECTS 7-10	TICA, M1, M2, A1, A2	87%
REVASCAT	(CAT). EVT vs SC (tPa non-responders), <80y	<8 hours	CT ASPECTS 7-10	TICA, M1	77%
ESCAPE	(CAN & others) EVT vs SC	<12 hours	CT ASPECTS >5 & “Good collaterals”	TICA, M1	78%
EXTEND-IA	(AUS & others) EVT+tPA vs tPA	<6 hours	CTP /MRI mismatch	TICA, M1, M2	100%
SWIFT-PRIME	(US & Europe) EVT+tPA vs tPA <80 y	<6 Hours	CTP : salvageble tissue: core < 70ml	TICA, M1, M2	100%

Rate of successful reperfusion



Final infarct volume

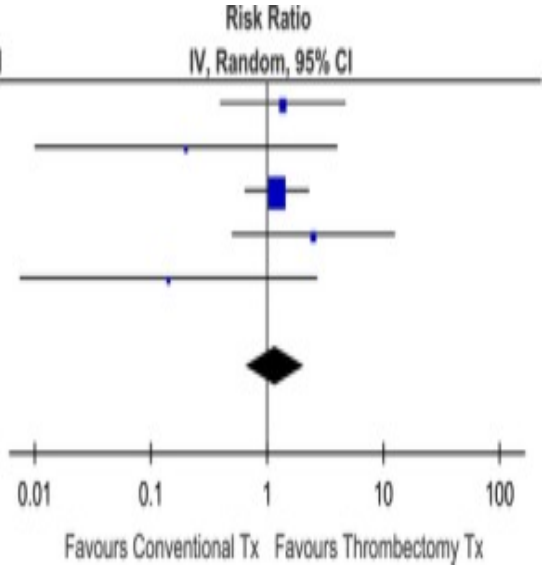


Symptomatic ICH

Study or Subgroup	Trombectomy Tx Events	Total	Conventional Tx Events	Total	Weight	Risk Ratio IV, Random, 95% CI
ESCAPE	6	165	4	150	19.3%	1.36 [0.39, 4.74]
EXTEND-IA	0	35	2	35	3.5%	0.20 [0.01, 4.02]
MR CLEAN	18	233	17	267	61.7%	1.21 [0.64, 2.30]
REVASCAT	5	103	2	103	11.8%	2.50 [0.50, 12.59]
SWIFT-PRIME	0	98	3	97	3.7%	0.14 [0.01, 2.70]
Total (95% CI)		**634**		**652**	**100.0%**	**1.17 [0.66, 2.07]**
Total events	29		28			

Heterogeneity: $Tau^2 = 0.03$; $Chi^2 = 4.22$, $df = 4$ ($P = 0.38$); $I^2 = 5\%$

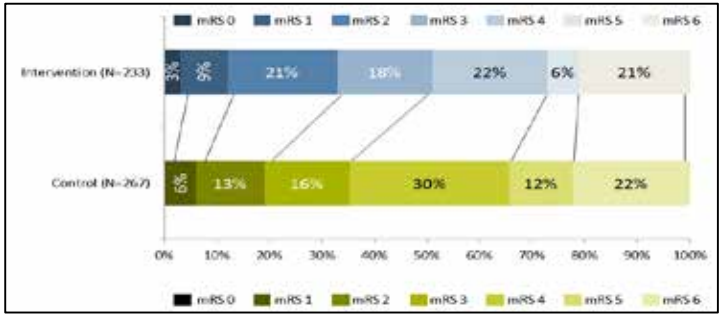
Test for overall effect: $Z = 0.55$ ($P = 0.58$)



Tsivgoulis G, Brain Behav. 2016

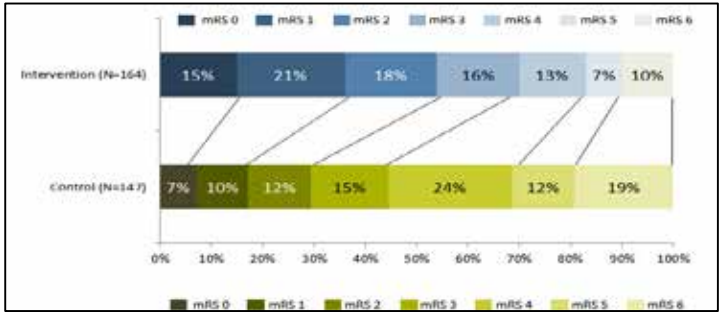
90-day outcome

MR CLEAN

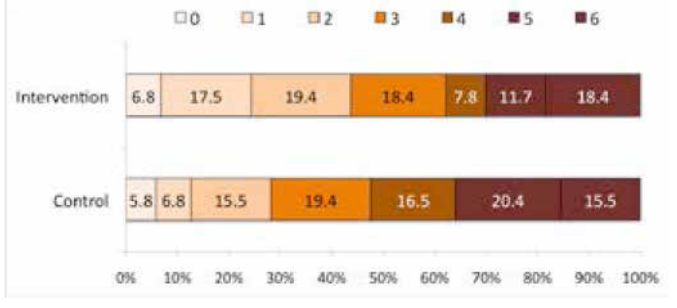


EXTEND-IA

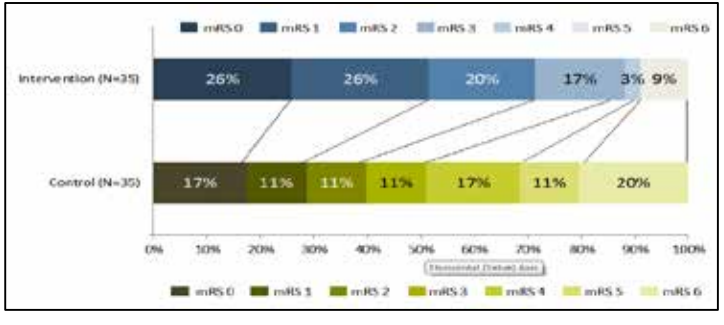
ESCAPE



REVASCAT



SWIFT PRIME



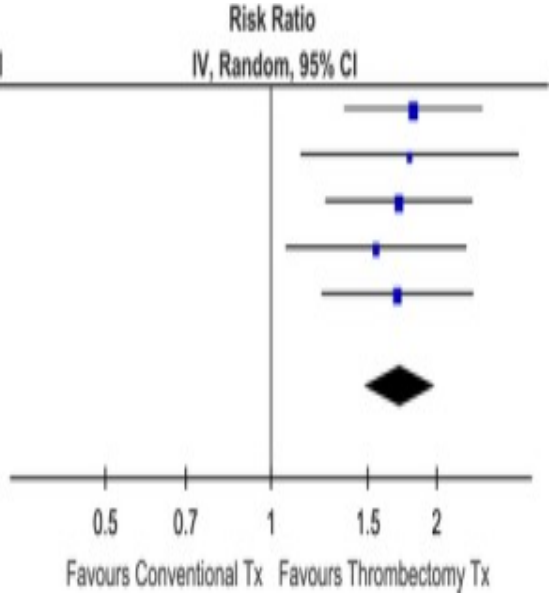
Absolut difference: 24%-33%

90-day outcome

Study or Subgroup	Trombectomy Tx Events	Total	Conventional Tx Events	Total	Weight	Risk Ratio IV, Random, 95% CI	NNT
ESCAPE	87	164	43	147	27.0%	1.81 [1.36, 2.42]	4
EXTEND-IA	25	35	14	35	10.9%	1.79 [1.13, 2.82]	3.2
MR CLEAN	76	233	51	267	23.9%	1.71 [1.25, 2.32]	9
REVASCAT	45	103	29	103	15.8%	1.55 [1.06, 2.27]	7
SWIFT-PRIME	59	98	33	93	22.4%	1.70 [1.23, 2.33]	4
Total (95% CI)		633		645	100.0%	1.72 [1.48, 1.99]	
Total events	292		170				

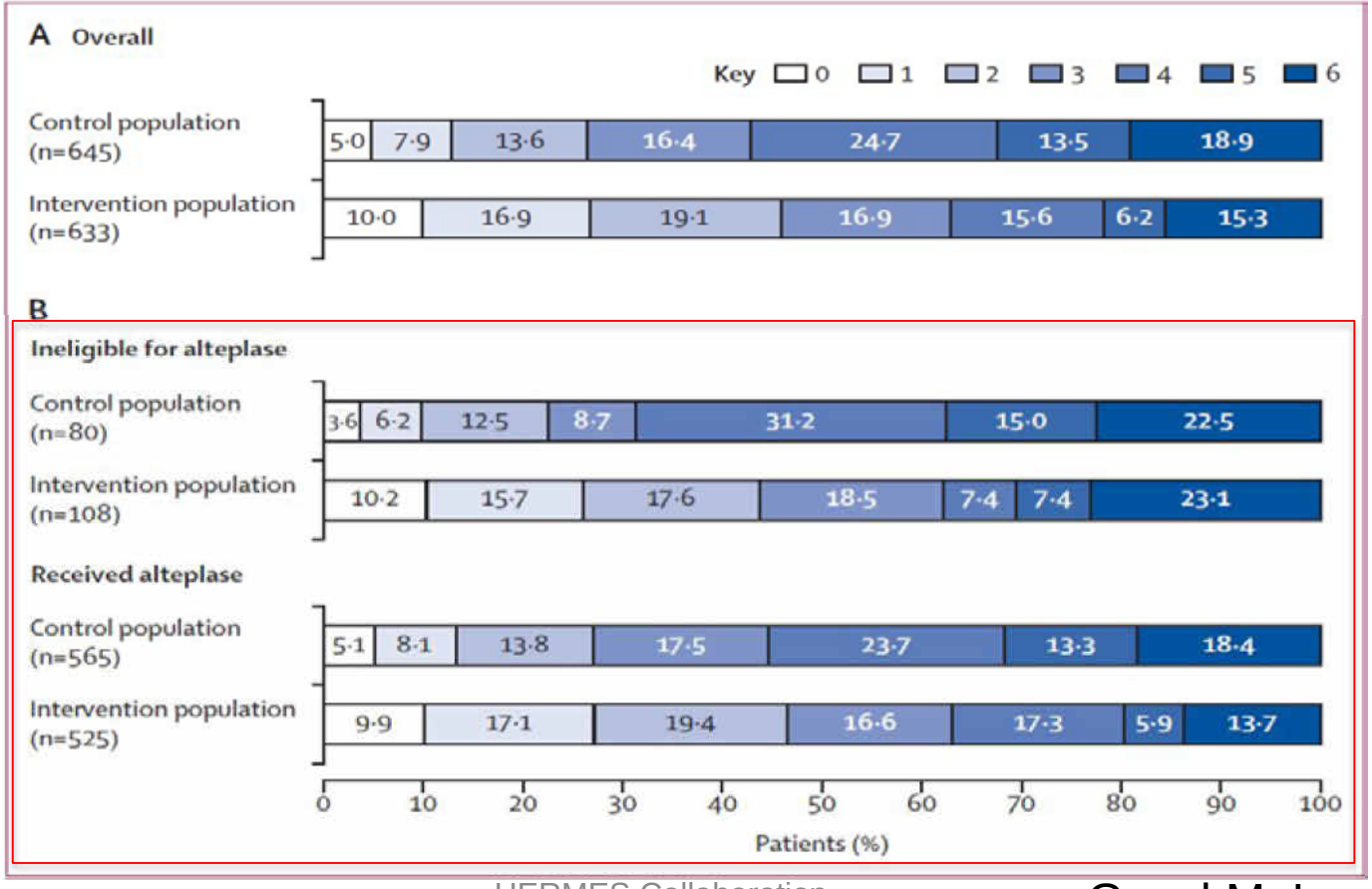
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.45$, $df = 4$ ($P = 0.98$); $I^2 = 0\%$

Test for overall effect: $Z = 7.02$ ($P < 0.00001$)



Tsivgoulis G, Brain Behav. 2016

Overall Treatment Effect
NNT = 2.6

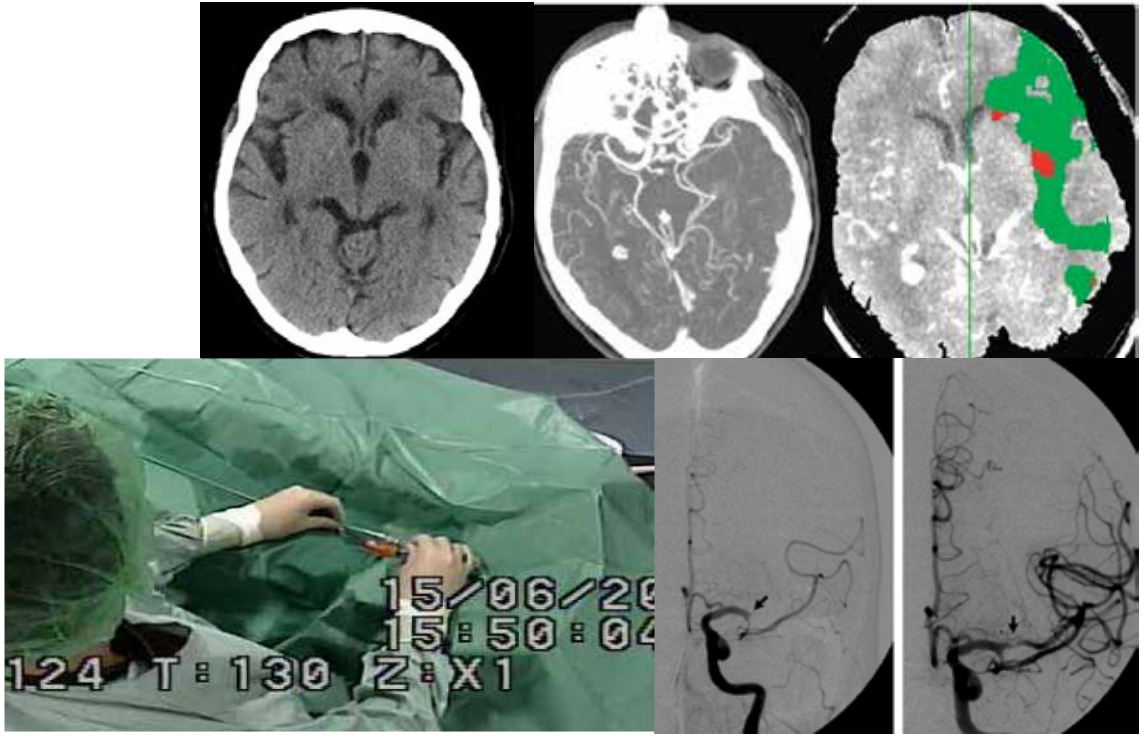


HERMES Collaboration

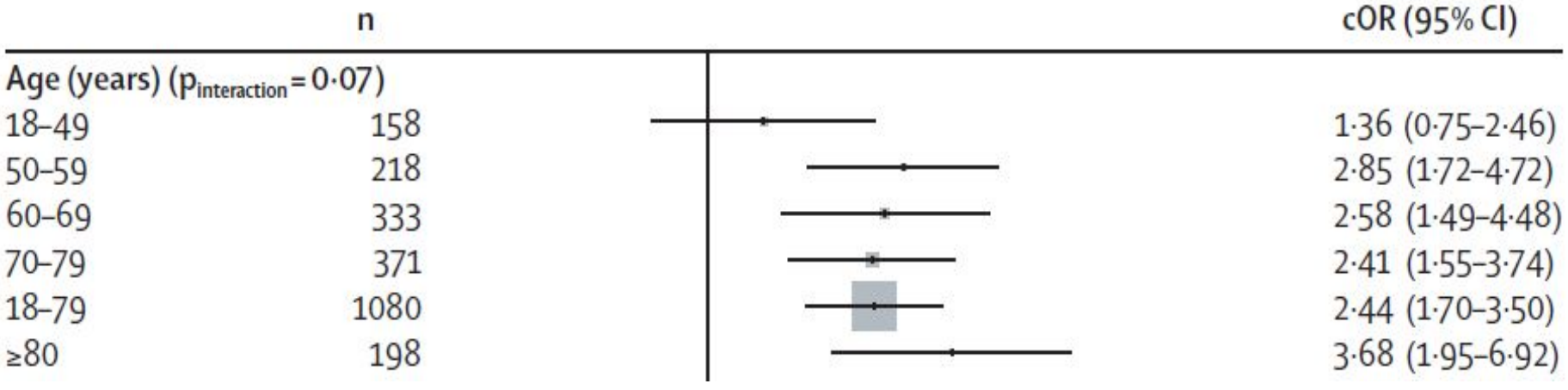
Goyal M, Lancet 2016

Who should be treated with thrombectomy?

- LVO (T ICA, M1 MCA.. some M2)
- Small infactc core
- Pre stroke mRS < 3
- As fast as possible!!
  - Door-to-groin time < 90min



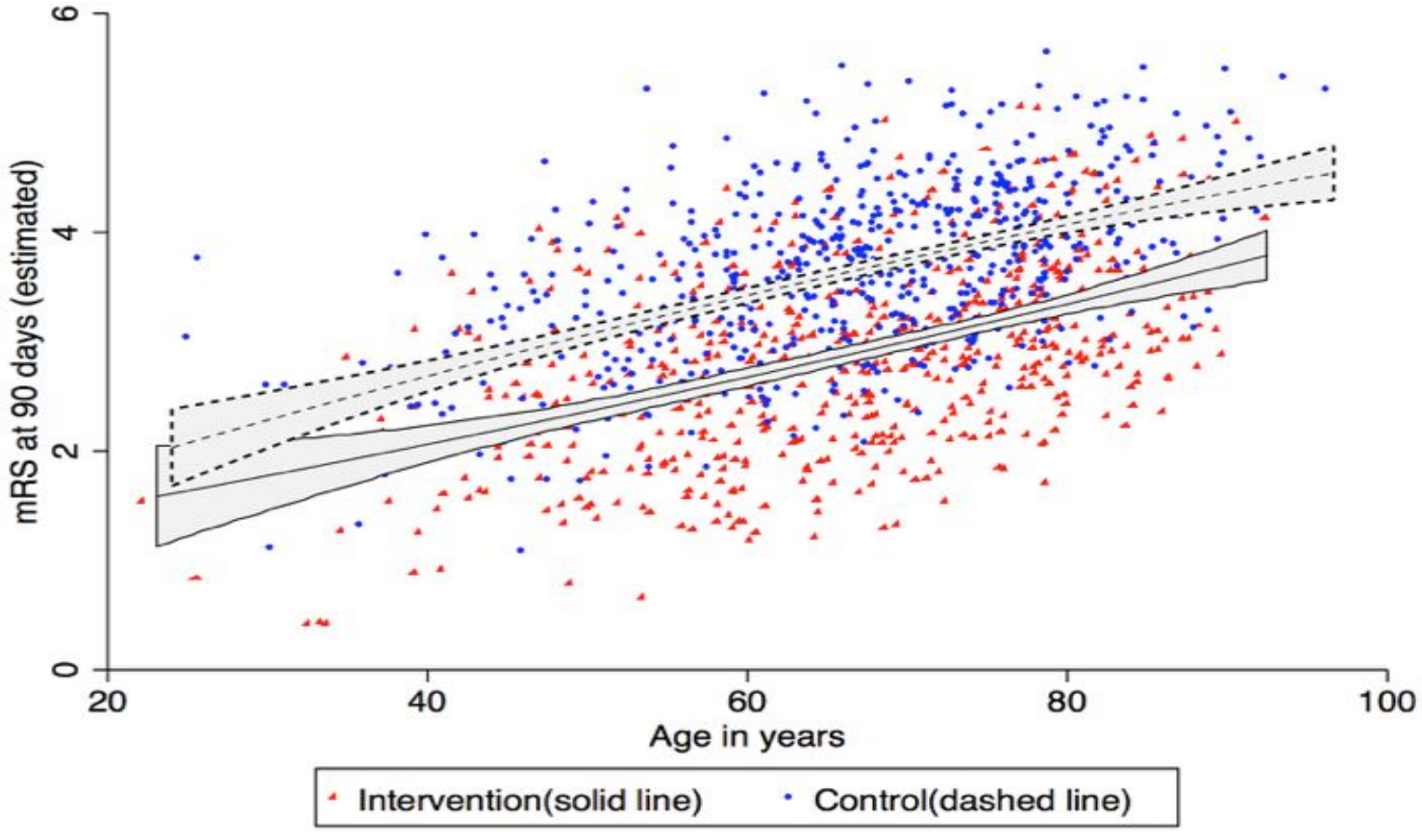
Treatment effect by age
mRS 0-2 at 90 days



HERMES Collaboration

Goyal M, Lancet 2016

Constant Effect Size by Age



HERMES Collaboration

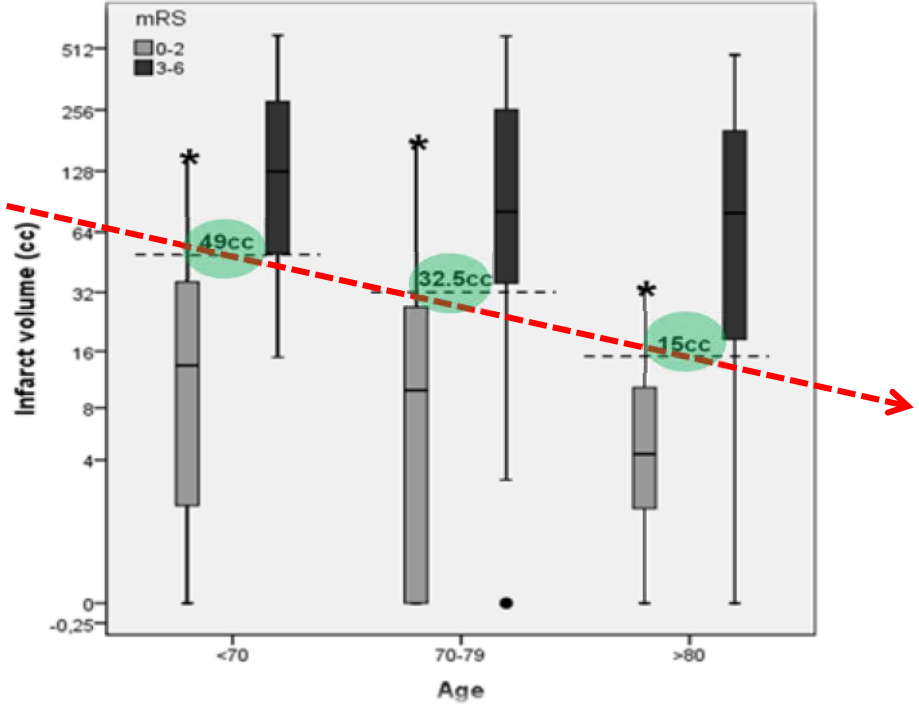
Goyal M, Lancet 2016

ORIGINAL RESEARCH

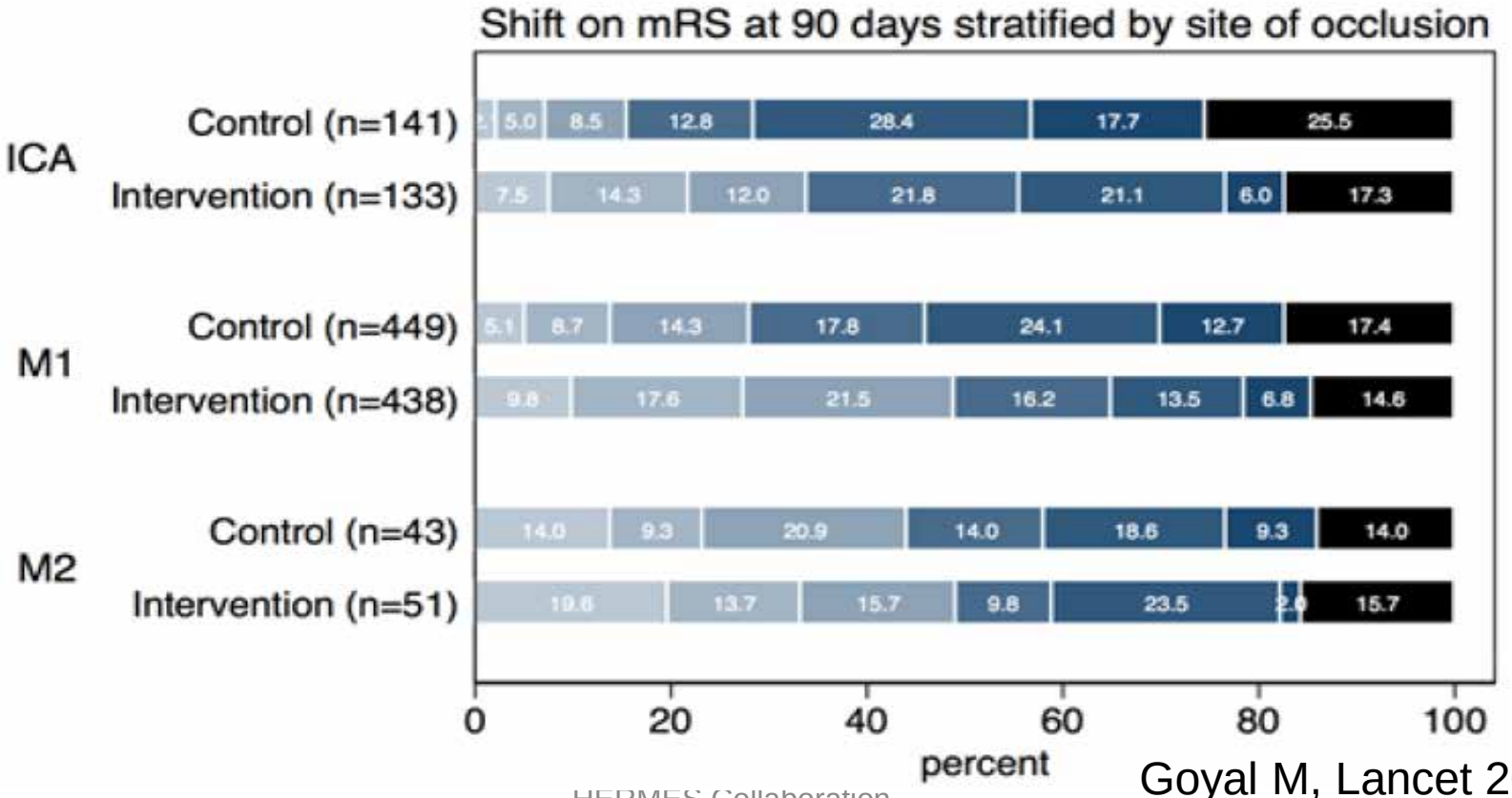
Age-adjusted infarct volume threshold for good outcome after endovascular treatment

Marc Ribo,[1] Alan Flores,[1] Eloy Mansilla,[1] Marta Rubiera,[1] Alejandro Tomasello,[2] Pilar Coscojuela,[2] Jorge Pagola,[1] David Rodriguez-Luna,[1] Marian Muchada,[1] José Alvarez-Sabín,[1] Carlos A Molina[1]

J NeuroIntervent Surg 2014;



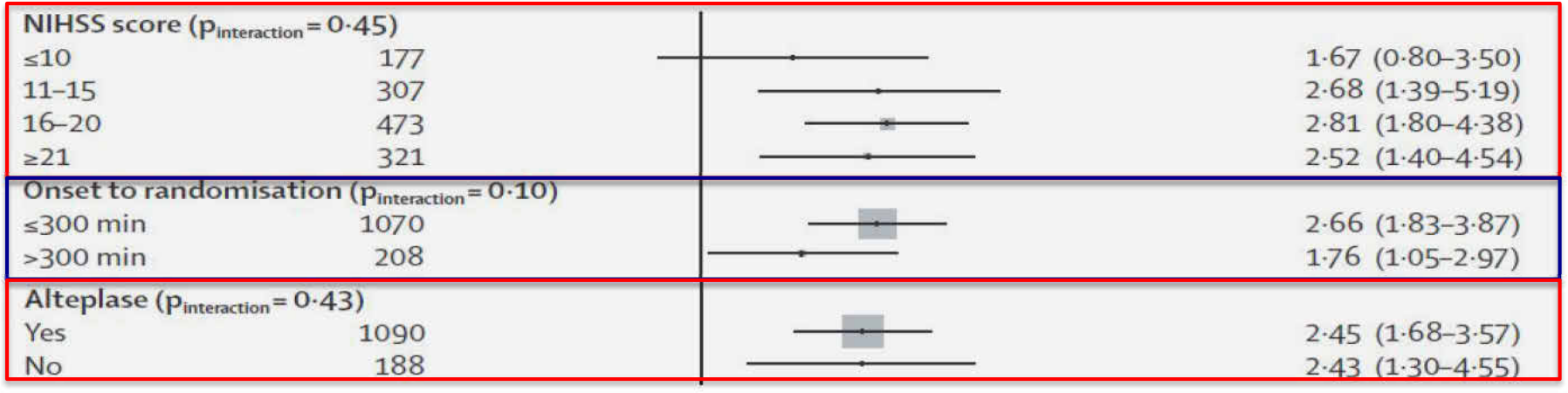
Treatment effect is strong across occlusion sites (p_{int}=0.35)



HERMES Collaboration

Goyal M, Lancet 2016

Effect size by NIHSS, time to randomization, and tPA use



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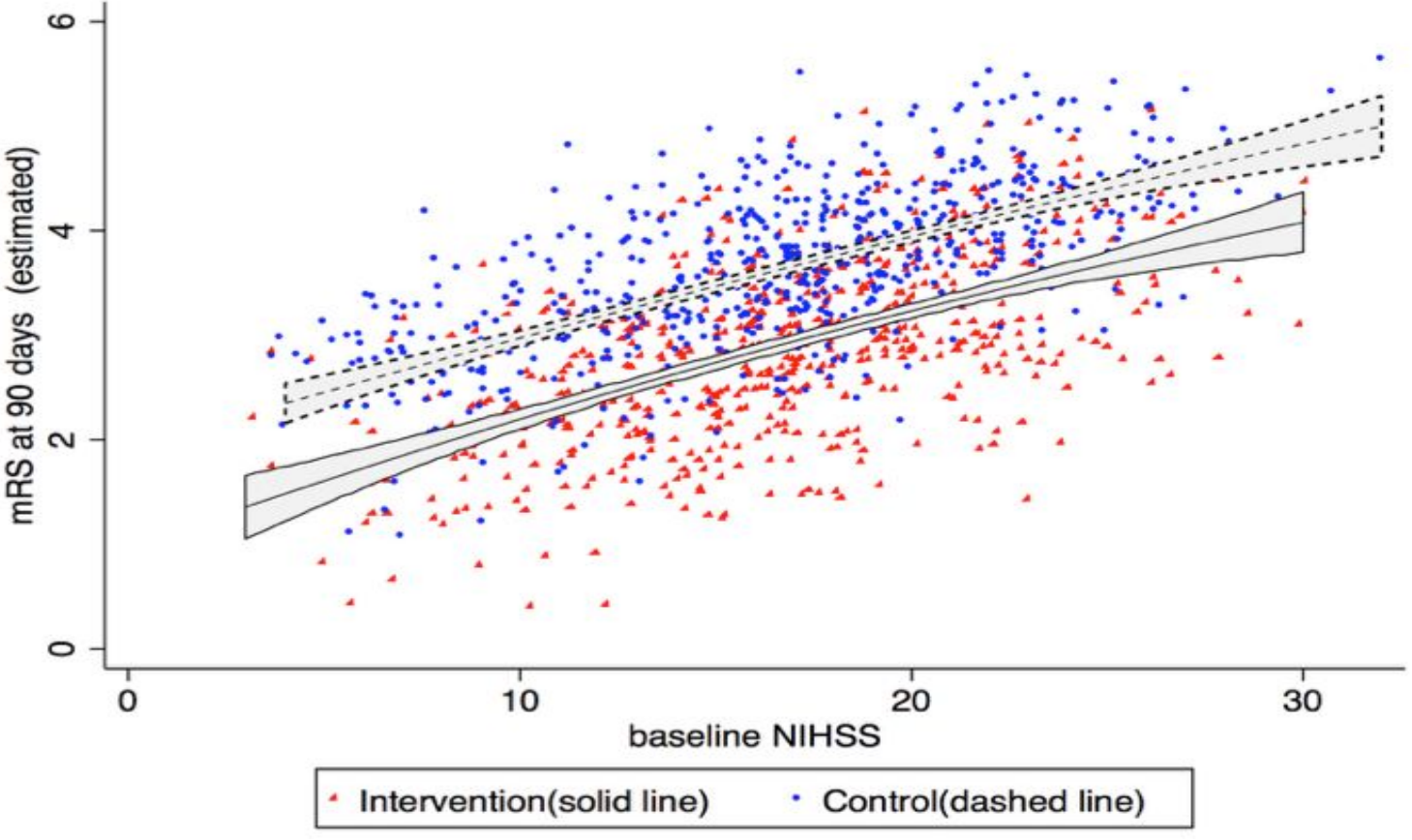
Constant effect size by NIHSS



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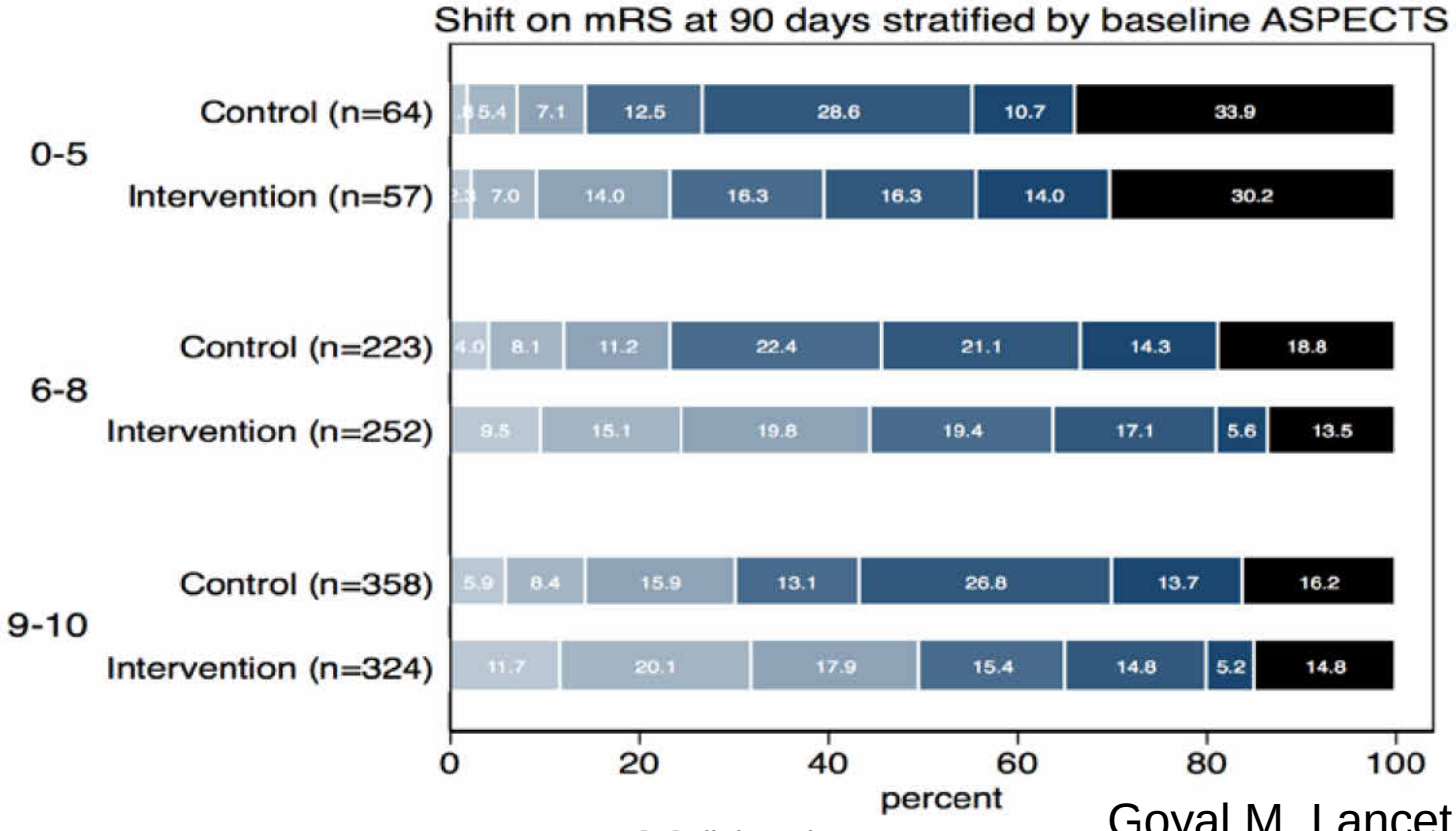
Goyal M, Lancet 2016

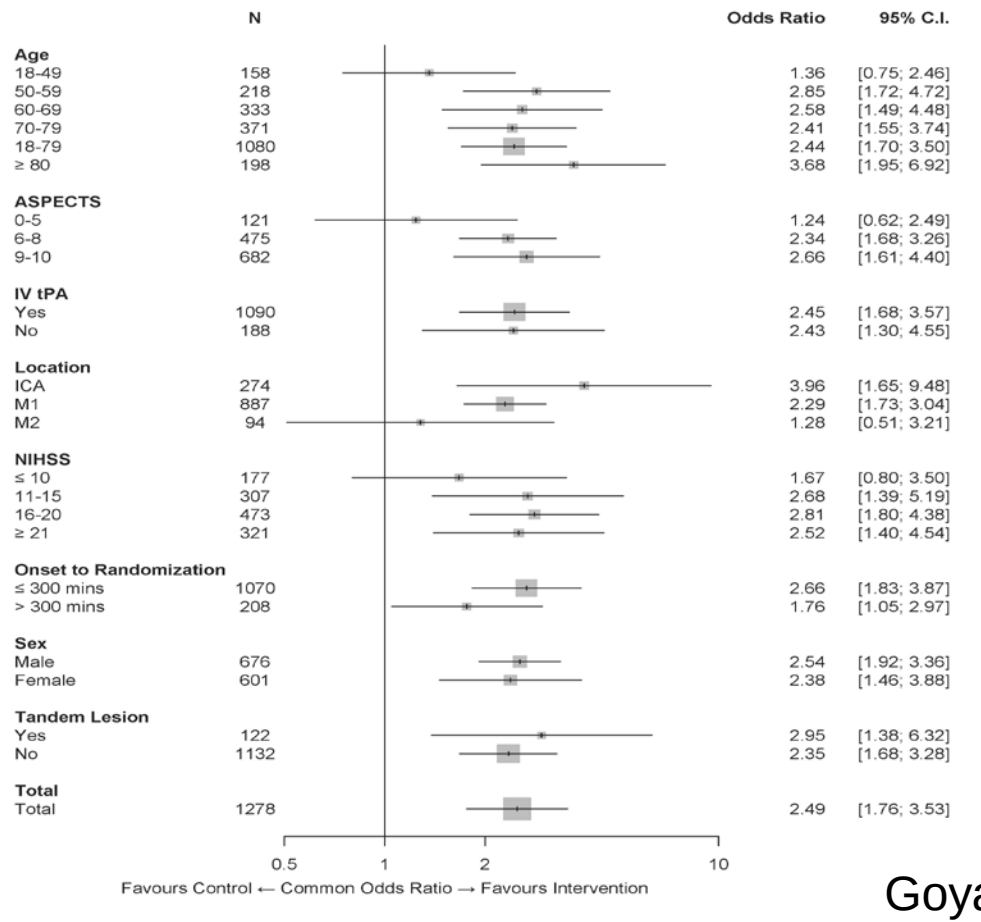
Treatment effect is present for all ASPECTS category (p_{int}=0.49)



HERMES Collaboration

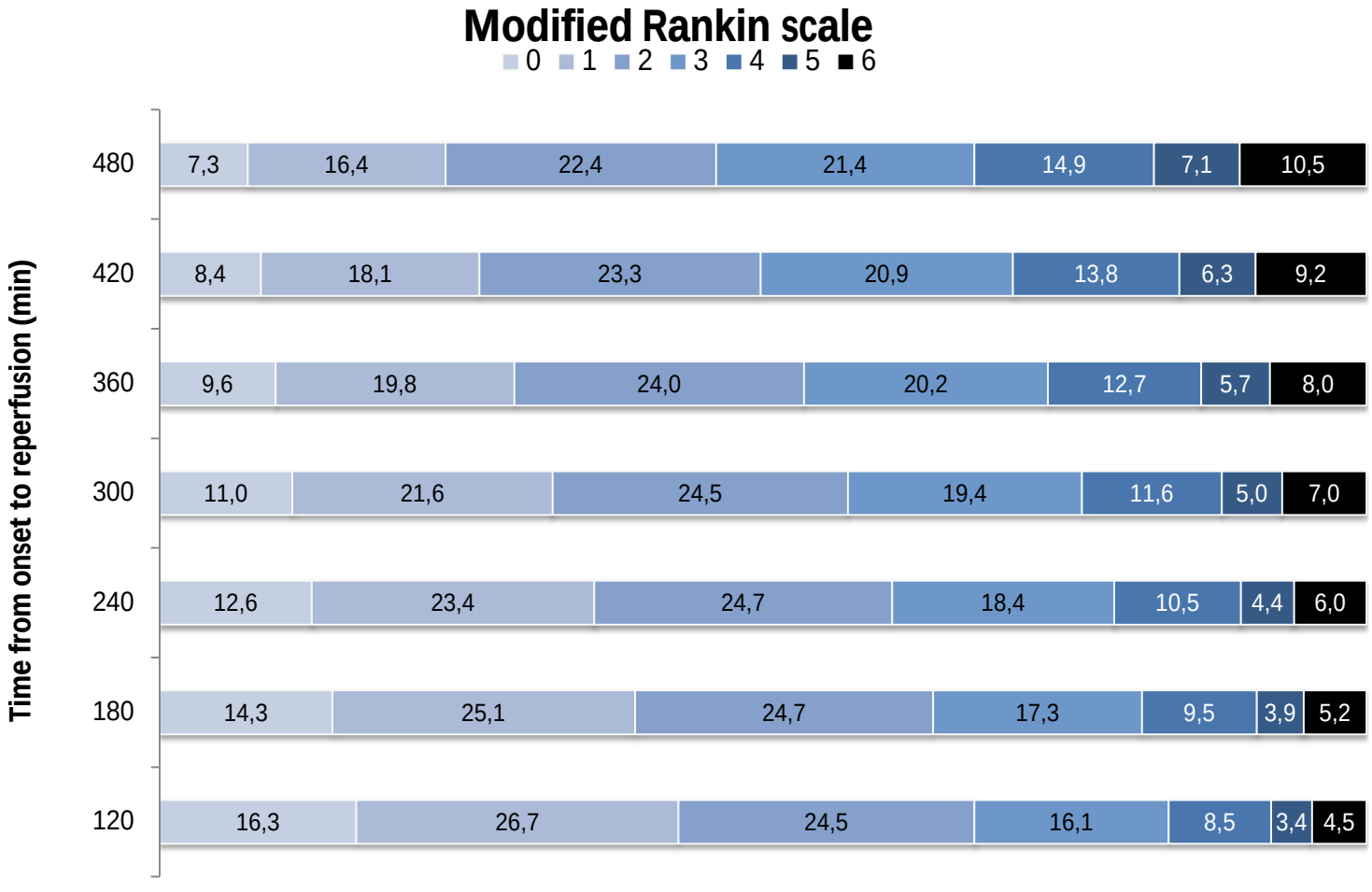
Goyal M, Lancet 2016

HERMES subgroup analysis



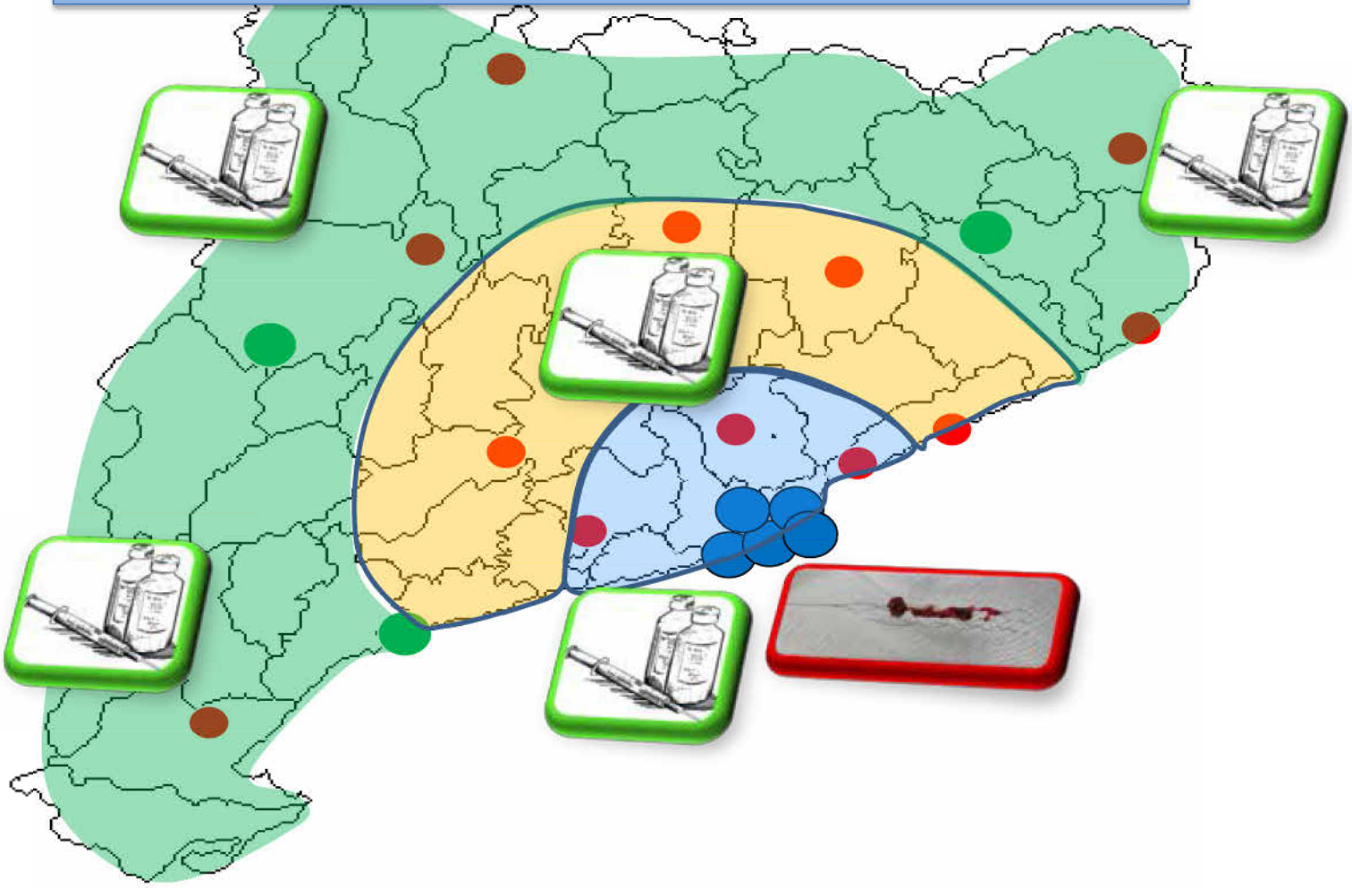
Goyal M, Lancet 2016

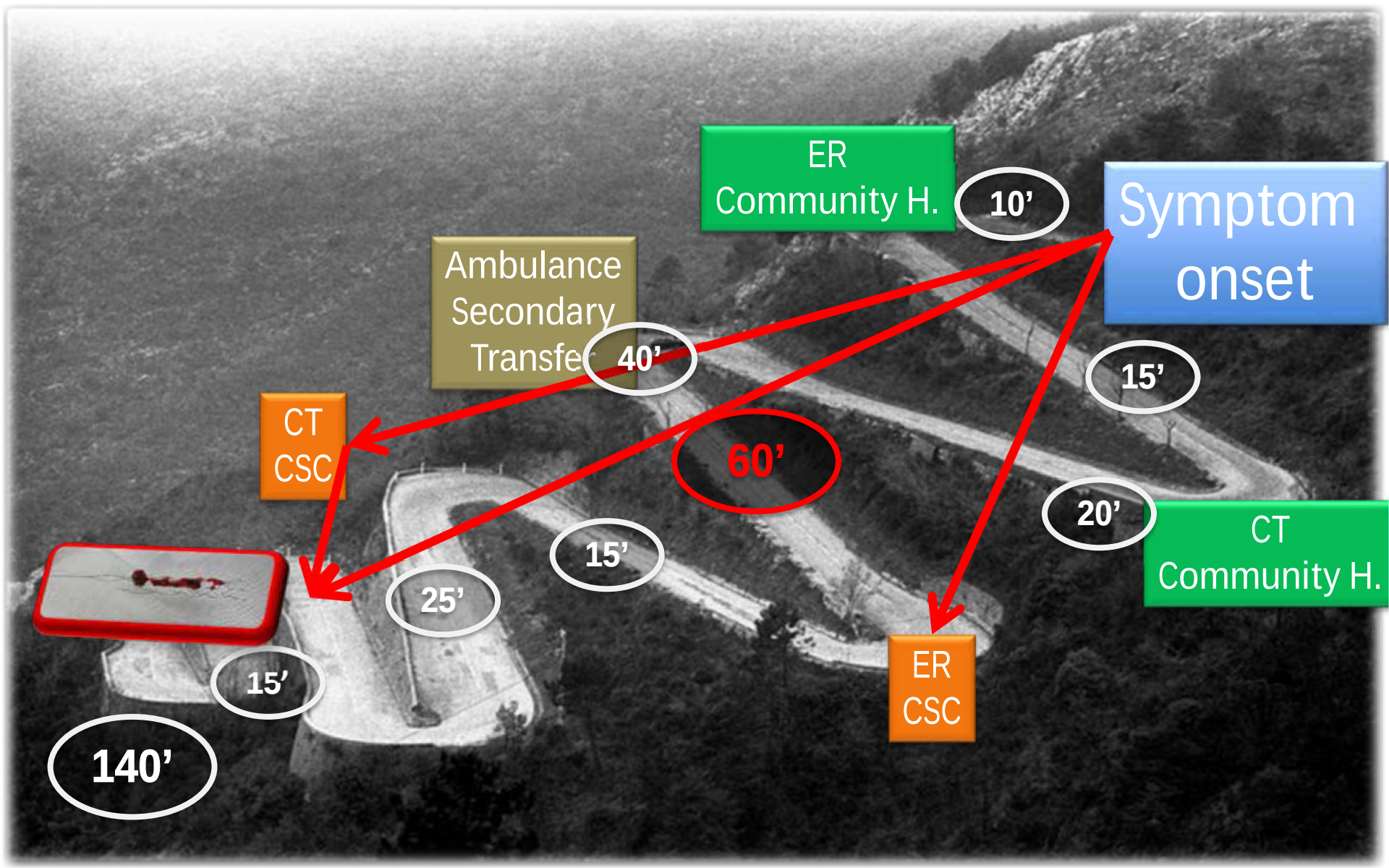
Relationship between time to reperfusion and outcome in thrombectomy trials



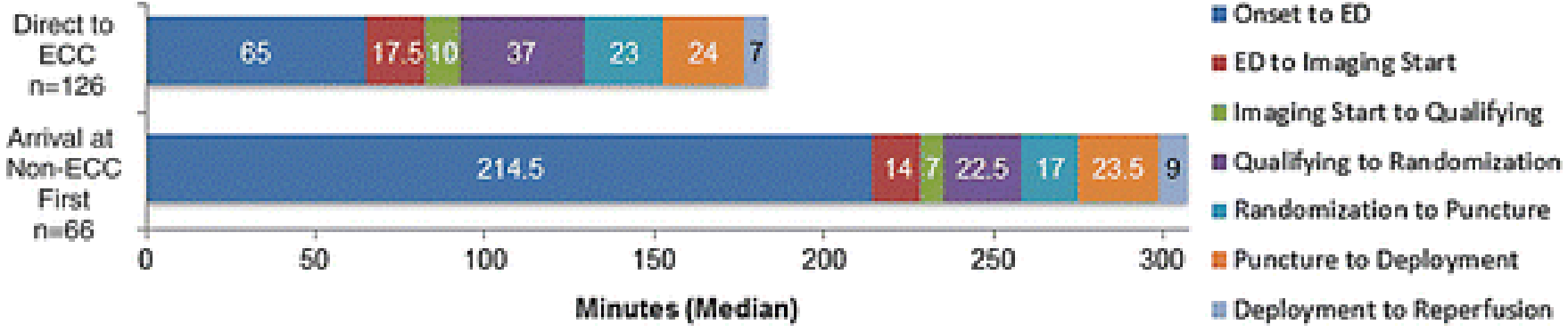
Saver J, ISC LA 2016

Telestroke and thrombectomy. Teleictus 2.0




ER
Community H.
10’
Symptom
onset
Ambulance
Secondary
Transfer
40’
15’
CT
CSC
60’
20’
CT
Community H.
15’
25’
15’
ER
CSC
140’

Workflow and time-to- treatment in ECC vs non-ECC



Goyal M, Radiology 2016

Stroke & MI Reperfusion Race

D2B

Onset-to-door

Door-to-radial

Punct-to-ballon

Onset-to-door

Door.to-needle
Door-to-groin

Groin-to-trombectomy


ID=001


ID=001
02/01/2013
10:52:49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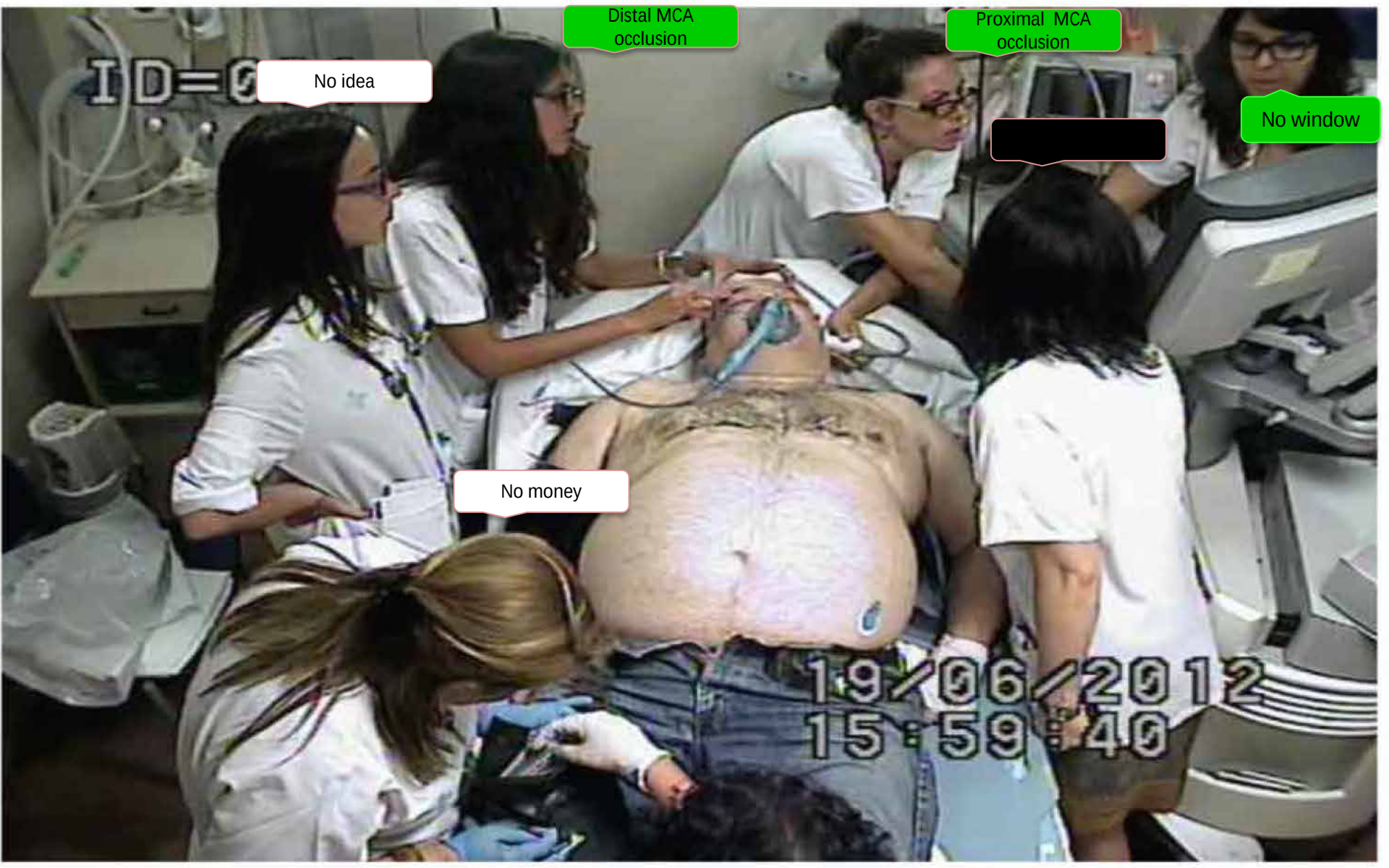
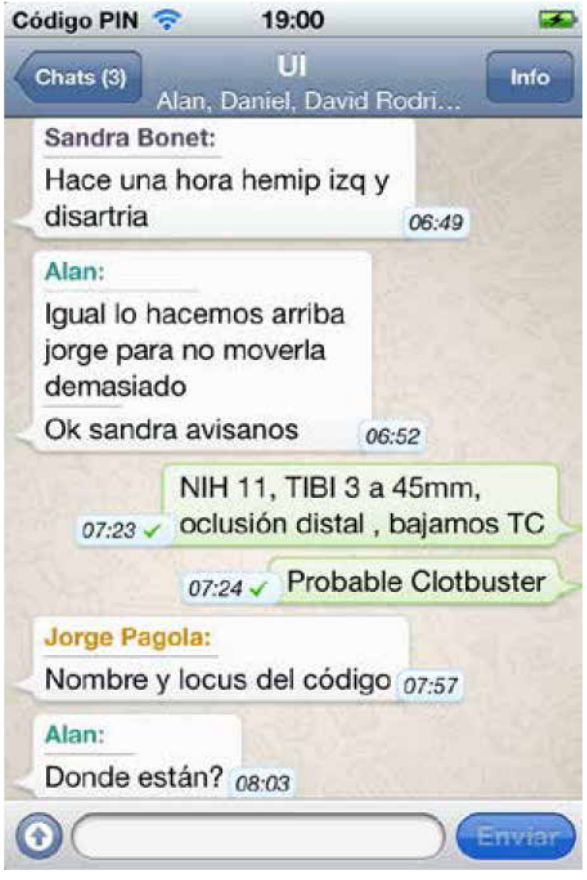
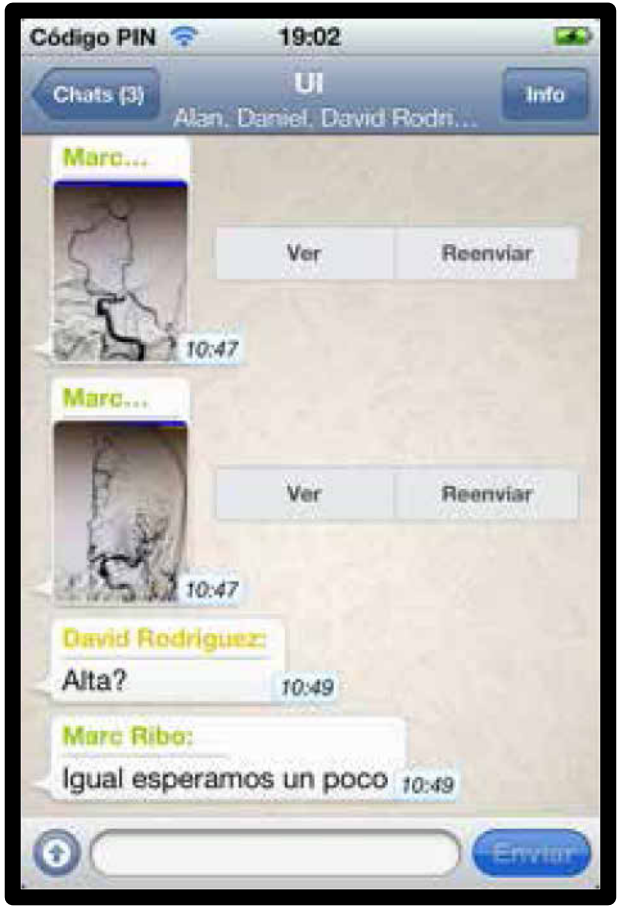
31/05/2012
16:20

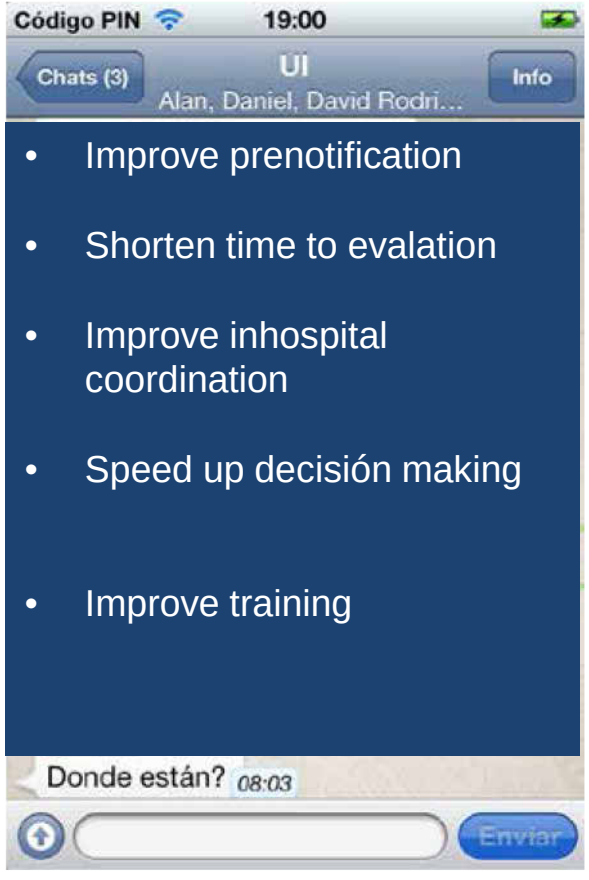

Distal MCA occlusion
Proximal MCA occlusion
No idea
No window
[redacted]
No money
19/06/2012
15:59:40

Stroke WhatsApp

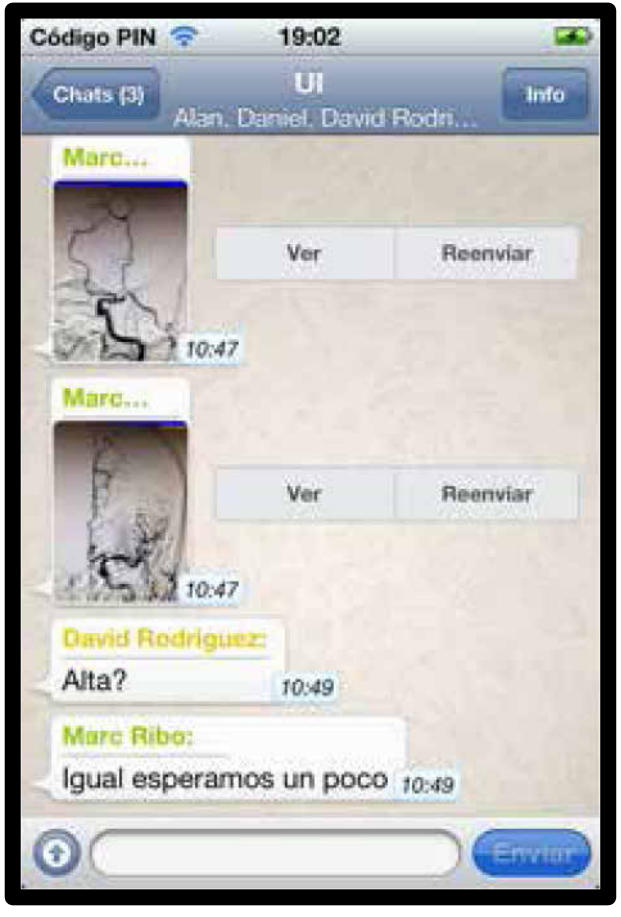




Stroke WhatsApp



- Improve prenotification
- Shorten time to evalation
- Improve inhospital coordination
- Speed up decisión making
- Improve training



Video monitoring of stroke thrombolysis

ER Arrival

Blood Sample

NIHSS

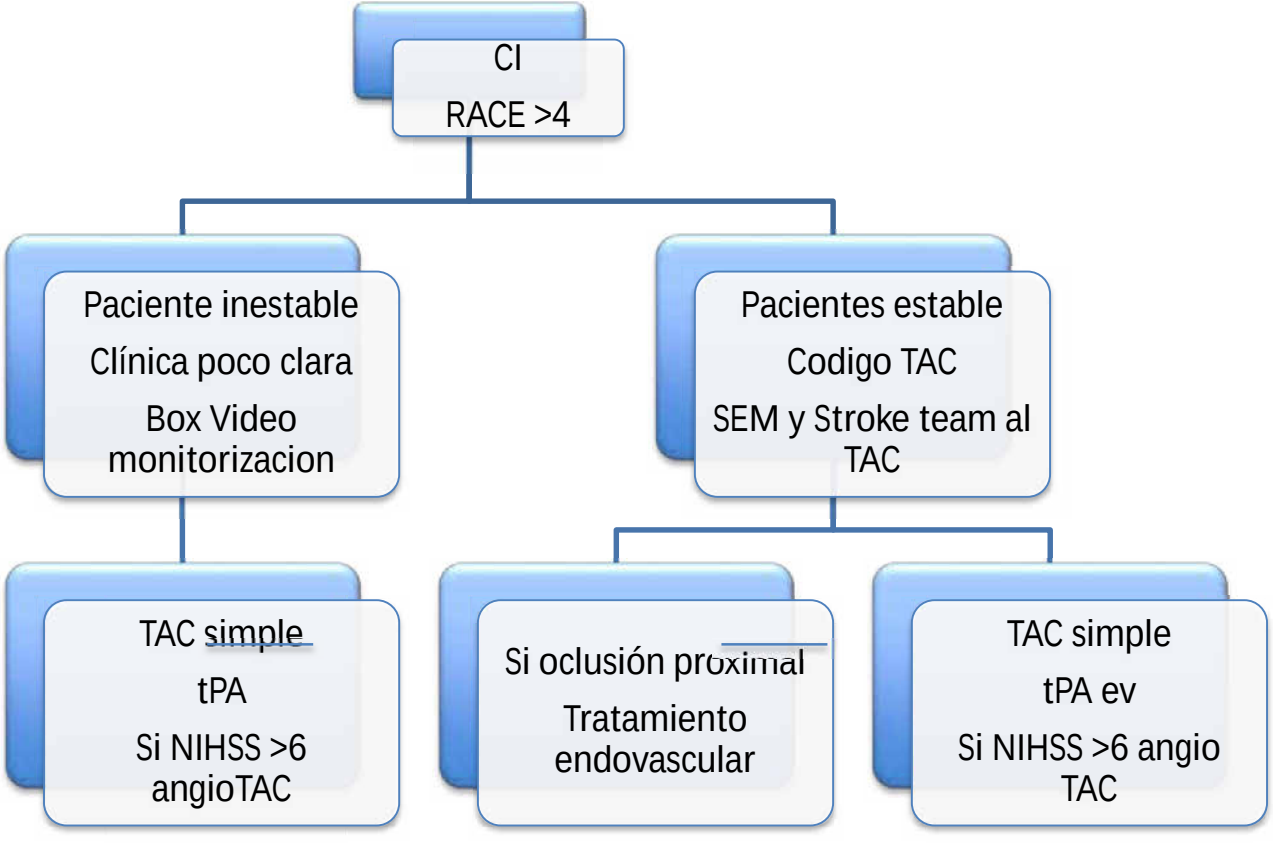
TCD

BP

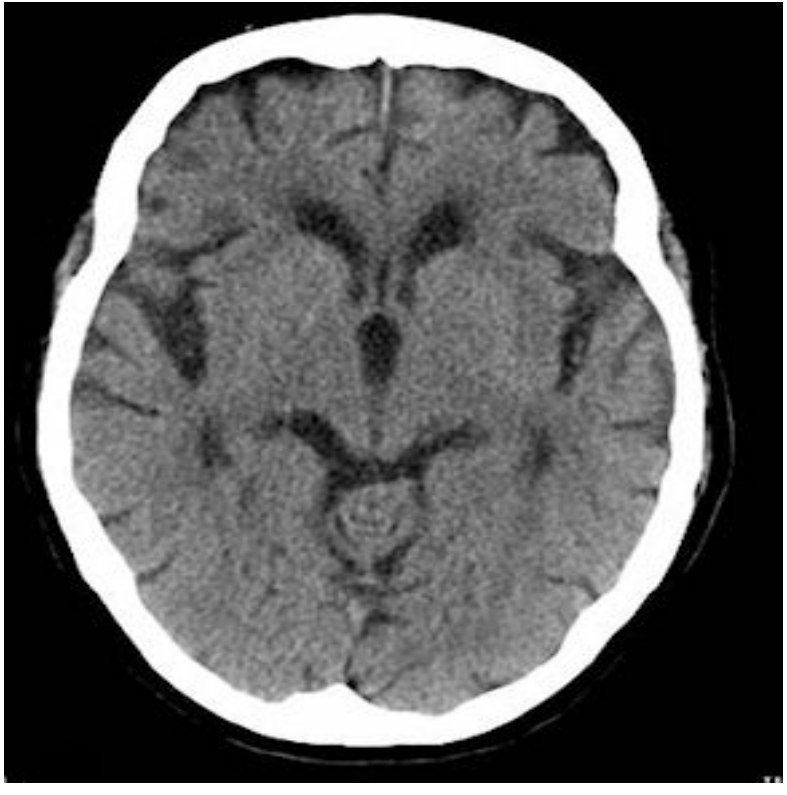
Departing VM_Box

ARPA

Activa **R**educción **P**uerta **A**guja

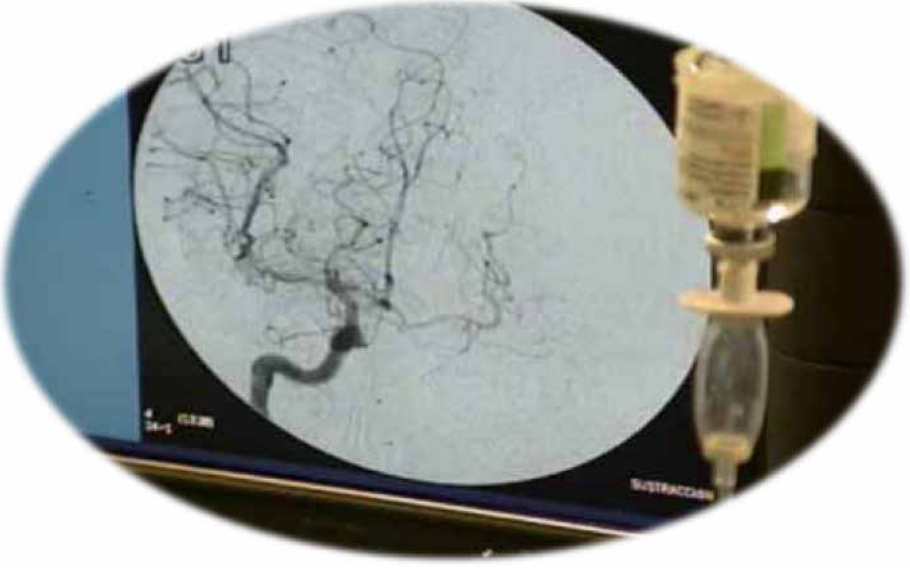


CT-tPA



Other issues, new questions

- Use of anesthesia...
- Skip iv-tPA ?
- ASPECTS 4-6 ?
- > 8 hours from onset ?



Conclusions

- EVT is a highly effective therapy across all subgroups
- EVT with tPA as add-on therapy is safe and effective
- Need to improve workflows and transfer algorithms to improve access to treatment and efficacy