

SOCIEDADE  
BRASILEIRA  
DE DOENÇAS  
CEREBROVASCULARES

**SNB**  
SOCIEDADE DE NEUROLOGIA DA BAHIA



**29º**  
CONGRESSO  
DE CARDIOLOGIA  
DO ESTADO DA BAHIA

**10 a 13** de maio de 2017  
Bahia Othon Palace Hotel  
Salvador - Bahia

**10** de maio de 2017  
5º Simpósio Internacional  
SBC-BA / Duke University

70 ANOS 1947-2017  
SBC-BA



HOSPITAL  
**SÃO RAFAEL**  
MONTE TABOR

# Declaração de Conflitos de Interesse

Bruno Bacellar Pedreira

De acordo com a Resolução 1595 / 2000 do Conselho Federal de Medicina e com a RDC 96 / 2008 da ANVISA, declaro que:

- › Recebi honorários de consultoria da Boehringer Ingelheim
- › NÃO sou funcionário, ou proprietário, ou sócio ou cotista, ou possuo ações de empresas farmacêuticas ou de equipamentos médicos





## Bruno Bacellar Pedreira



**AVCi agudo: Trombólise vs trombectomia facilitada vs trombectomia - escolha certa para o paciente certo**



# Tratamento do AVCi

## - Nível 1A de Evidência

- 1 - Trombólise endovenosa até 4,5h do ictus
- 2 - Internação em *Stroke Unit*
- 3 - Aspirina para prevenção de recorrência precoce
- 4 - Craniectomia descompressiva
- 5 – Trombectomia mecânica para lesões proximais
  - ( MR CLEAN, ESCAPE, SWIFT-PRIME, REVASCAT e EXTEND-IA )



# Agenda:

- > *Trombólise Intravenosa*
- > *Trombectomia endovascular*
- > *Situações onde há escolha certa*
- > *Argumentos para discussão / Quais as evidências*
- > *Perspectivas*





# Tempo é cérebro



## Ritmo estimado de perda de circuitos neuronais em AVCi típico

	Neurônios perdidos	Sinapses perdidas	Fibras mielinizadas perdidas	Envelhecimento acelerado
Por AVCi	1.2 bilhões	8.3 trilhões	7140 km	36 a
Por hora	120 milhões	830 bilhões	714 km	3.6 a
Por minuto	1.9 milhões	14 bilhões	12 km	3.1 sem
Por segundo	32,000	230 milhões	200 m	8.7 h

# The New England Journal of Medicine

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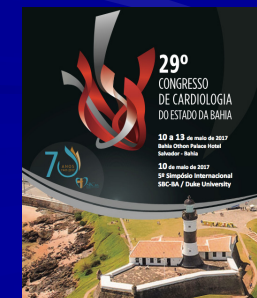
## TISSUE PLASMINOGEN ACTIVATOR FOR ACUTE ISCHEMIC STROKE

THE NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE rt-PA STROKE STUDY GROUP\*

## Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke

Werner Hacke, M.D., Markku Kaste, M.D., Erich Bluhmki, Ph.D., Miroslav Brozman, M.D., Antoni Dávalos, M.D.,  
Donata Guidetti, M.D., Vincent Larrue, M.D., Kennedy R. Lees, M.D., Zakaria Medeghri, M.D.,  
Thomas Machnig, M.D., Dietmar Schneider, M.D., Rüdiger von Kummer, M.D., Nils Wahlgren, M.D.,  
and Danilo Toni, M.D., for the ECASS Investigators\*

N Engl J Med 2008;359:1317-29.



# Time to treatment with intravenous alteplase and outcome in stroke: an updated pooled analysis of ECASS, ATLANTIS, NINDS, and EPITHET trials

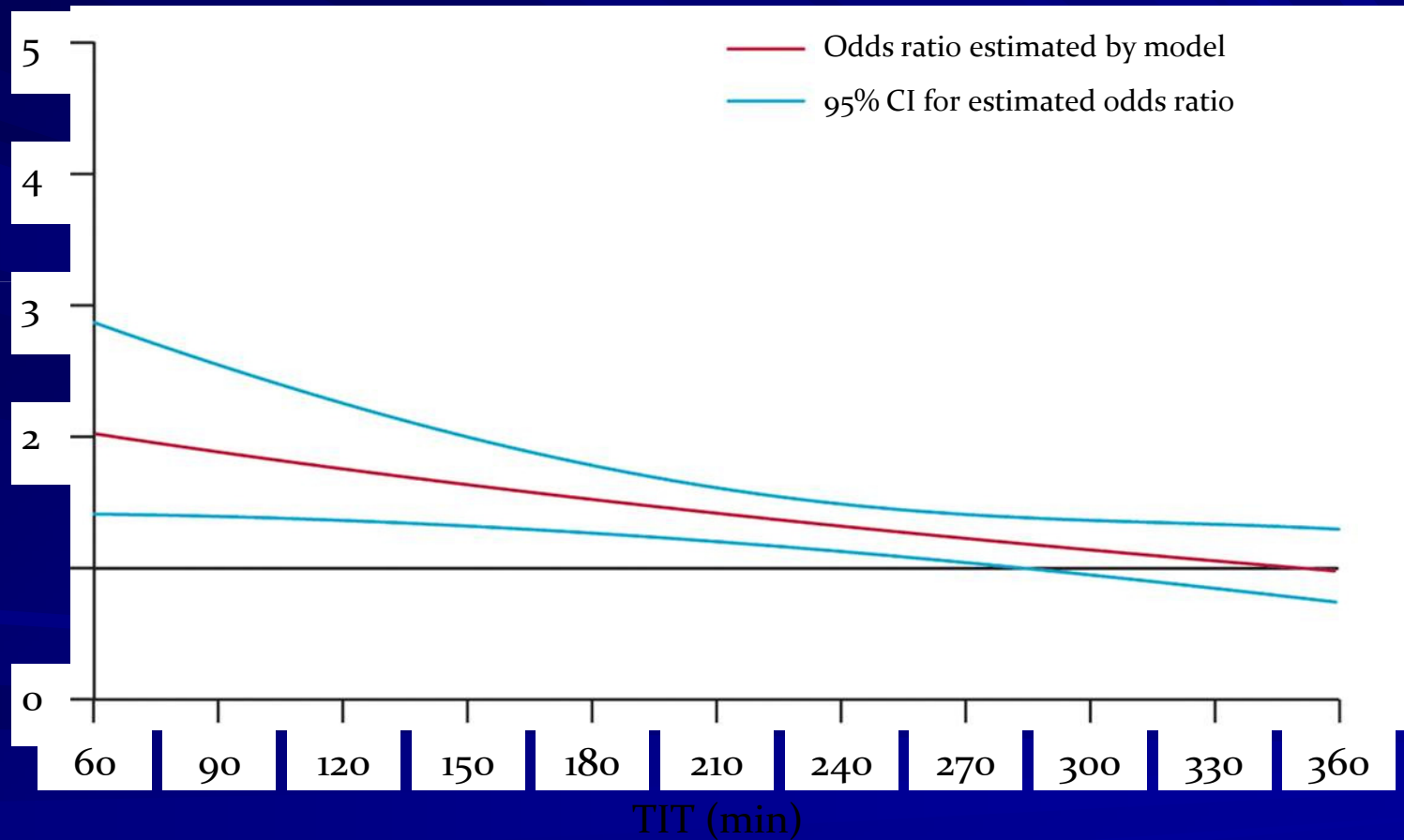
*Kennedy R Lees, Erich Bluhmki, Rüdiger von Kummer, Thomas G Brott, Danilo Toni, James C Grotta, Gregory W Albers, Markku Kaste, John R Marler, Scott A Hamilton, Barbara C Tilley, Stephen M Davis, Geoffrey A Donnan, Werner Hacke, for the ECASS, ATLANTIS, NINDS, and EPITHET rt-PA Study Group Investigators\**





# Time to treatment with intravenous alteplase and outcome in stroke: an updated pooled analysis of ECASS, ATLANTIS, NINDS, and EPITHET trials

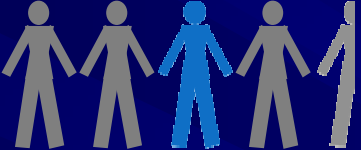
Kennedy R Lees, Erich Bluhmki, Rüdiger von Kummer, Thomas G Brott, Danilo Toni, James C Grotta, Gregory W Albers, Markku Kaste, John R Marler, Scott A Hamilton, Barbara C Tilley, Stephen M Davis, Geoffrey A Donnan, Werner Hacke, for the ECASS, ATLANTIS, NINDS, and EPITHET rt-PA Study Group Investigators\*



Wahlgren et al. *Lancet* 2008;372:1303-1309.  
Lees et al. *Lancet* 2010;375:1695-1703.



# Trombólise: Número necessário para tratar (NNT) para atingir uma recuperação excelente (mRS 0-1)

≤ 90 mins  NNT=4 to 5

90 min - 3 h  NNT=9

3 - 4.5 h  NNT=14

Lees et al. *Lancet* 2010;375:1695-1703.



# Diretrizes da ABN (Brasil)

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**Alteplase (rt-PA) é recomendado com nível 1A de evidência para o tratamento do AVC isquêmico agudo em adultos se:**

O tratamento é iniciado o mais cedo possível dentro de 4,5 horas do início dos sintomas do AVC

e

A hemorragia intracraniana tiver sido excluída por técnicas de neuroimagem apropriadas



*The* **NEW ENGLAND**

**ORIGINAL ARTICLE**

**ORIGINAL ARTICLE**

*The* **NEW ENGLAND**

**ORIGINAL ARTICLE**

## **Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke**

T.G. Jovin, A. Chamorro, E. Cobo, M.A. de Miquel, C.A. Molina, A. Rovira,  
L. San Román, J. Serena, S. Abilleira, M. Ribó, M. Millán, X. Urra, P. Cardona,  
E. López-Cancio, A. Tomasello, C. Castaño, J. Blasco, L. Aja, L. Dorado,  
H. Quesada, M. Rubiera, M. Hernández-Pérez, M. Goyal, A.M. Demchuk,  
R. von Kummer, M. Gallofré, and A. Dávalos, for the REVASCAT Trial Investigators\*



# Endovascular thrombectomy after large-vessel ischaemic stroke: a meta-analysis of individual patient data from five randomised trials

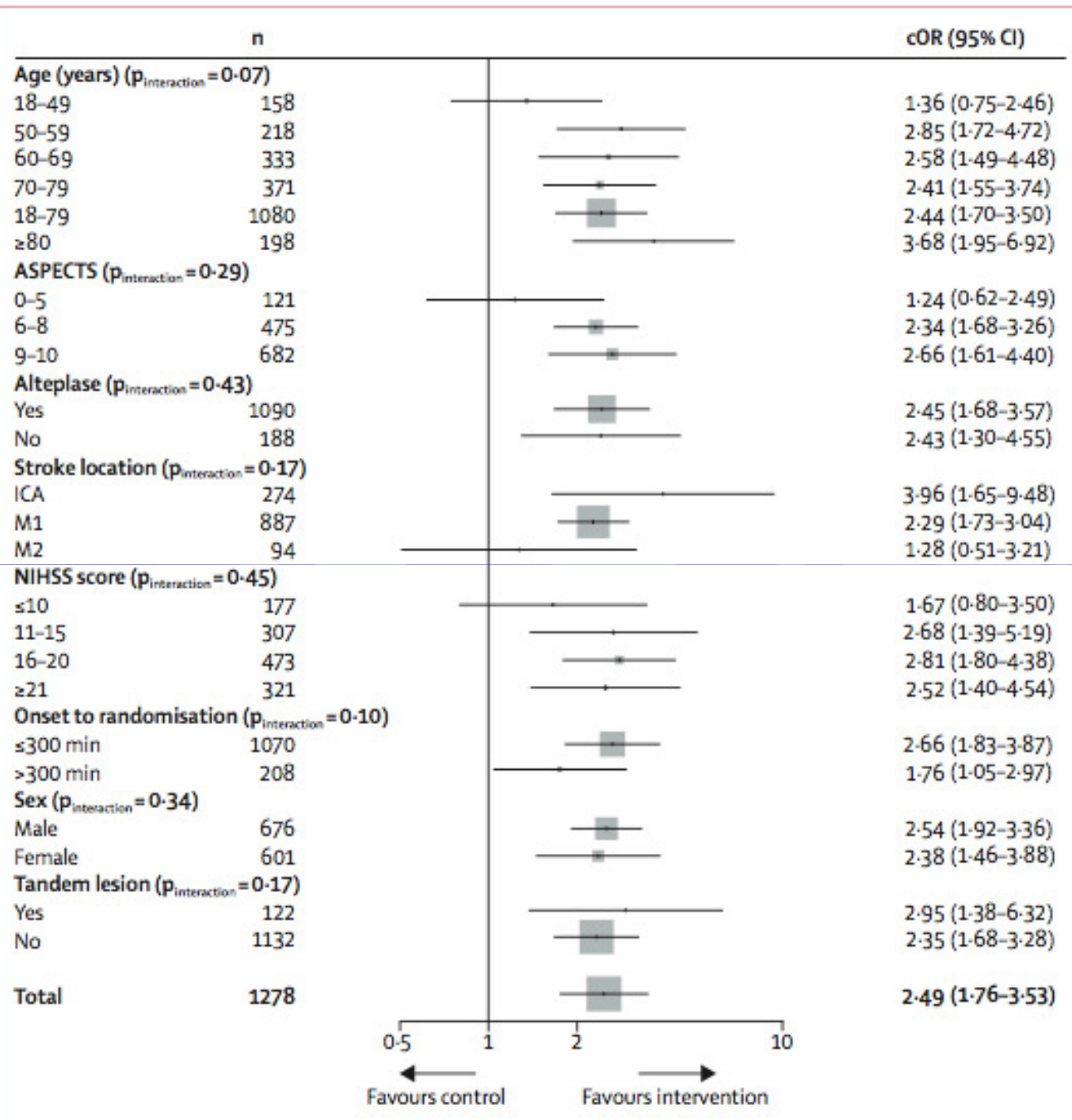
*Mayank Goyal, Bijoy K Menon, Wim H van Zwam, Diederik W J Dippel, Peter J Mitchell, Andrew M Demchuk, Antoni Dávalos, Charles B L M Majoie, Aad van der Lugt, Maria A de Miquel, Geoffrey A Donnan, Yvo B W E M Roos, Alain Bonafe, Reza Jahan, Hans-Christoph Diener, Lucie A van den Berg, Elad I Levy, Olvert A Berkhemer, Vitor M Pereira, Jeremy Rempel, Mònica Millán, Stephen M Davis, Daniel Roy, John Thornton, Luis San Román, Marc Ribó, Debbie Beumer, Bruce Stouch, Scott Brown, Bruce CV Campbell, Robert J van Oostenbrugge, Jeffrey L Saver, Michael D Hill, Tudor G Jovin, for the HERMES collaborators*

## Original Investigation

# Endovascular Thrombectomy for Acute Ischemic Stroke A Meta-analysis

Jetan H. Badhiwala, MD; Farshad Nassiri, MD; Waleed Alhazzani, MD; Magdy H. Selim, MD; Forough Farrokhyar, PhD; Julian Spears, MD; Abhaya V. Kulkarni, MD; Sheila Singh, MD; Abdulrahman Alqahtani, MD; Bram Rochweg, MD; Mohammad Alshahrani, MD; Naresh K. Murty, MD; Adel Alhazzani, MD; Blake Yarascavitch, MD; Kesava Reddy, MD; Osama O. Zaidat, MD; Saleh A. Almenawer, MD



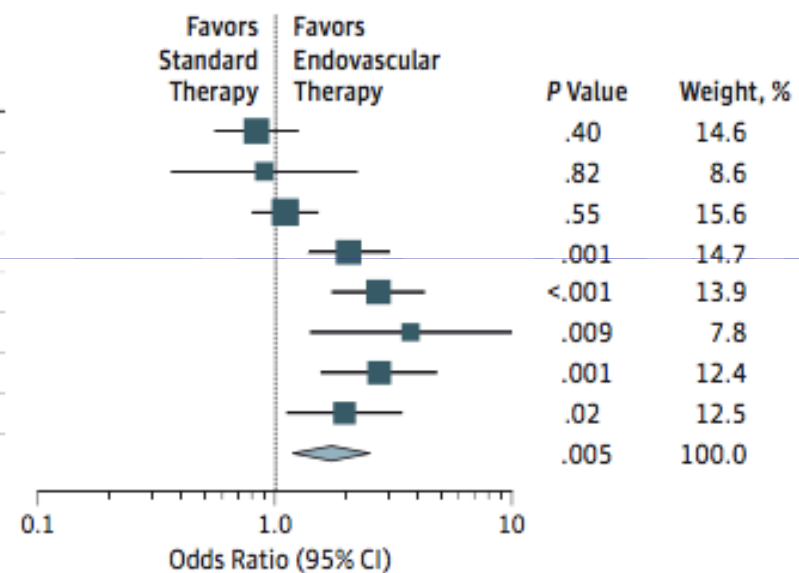




**A** Functional independence (modified Rankin Scale score 0-2) at 90 d

Source	Endovascular Therapy Events/No.	Standard Therapy Events/No.	Odds Ratio (95% CI)
SYNTHESIS, <sup>26</sup> 2013	76/181	84/181	0.84 (0.55-1.27)
MR RESCUE, <sup>27</sup> 2013	12/64	11/54	0.90 (0.36-2.25)
IMS III, <sup>28</sup> 2013	177/415	86/214	1.11 (0.79-1.55)
MR CLEAN, <sup>29</sup> 2015	76/233	51/267	2.05 (1.36-3.09)
ESCAPE, <sup>30</sup> 2015	87/164	43/147	2.73 (1.71-4.37)
EXTEND-IA, <sup>31</sup> 2015	25/35	14/35	3.75 (1.38-10.17)
SWIFT-PRIME, <sup>32</sup> 2015	59/98	33/93	2.75 (1.53-4.94)
REVASCAT, <sup>33</sup> 2015	45/103	29/103	1.98 (1.11-3.53)
Overall	557/1293	351/1094	1.71 (1.18-2.49)

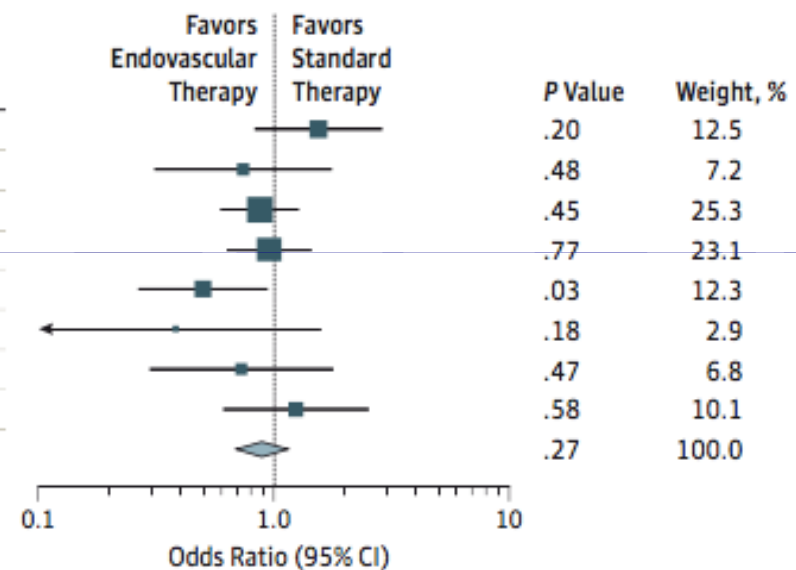
$I^2 = 75.4\%$ ,  $P < .01$



**B** Mortality at 90 d

Source	Endovascular Therapy Events/No.	Standard Therapy Events/No.	Odds Ratio (95% CI)
SYNTHESIS, <sup>26</sup> 2013	26/181	18/181	1.52 (0.80-2.88)
MR RESCUE, <sup>27</sup> 2013	12/64	13/54	0.73 (0.30-1.76)
IMS III, <sup>28</sup> 2013	83/434	48/222	0.86 (0.58-1.28)
MR CLEAN, <sup>29</sup> 2015	49/233	59/267	0.94 (0.61-1.44)
ESCAPE, <sup>30</sup> 2015	17/164	28/147	0.49 (0.26-0.94)
EXTEND-IA, <sup>31</sup> 2015	3/35	7/35	0.38 (0.09-1.59)
SWIFT-PRIME, <sup>32</sup> 2015	9/98	12/97	0.72 (0.29-1.79)
REVASCAT, <sup>33</sup> 2015	19/103	16/103	1.23 (0.59-2.55)
Overall	218/1312	201/1106	0.87 (0.68-1.12)

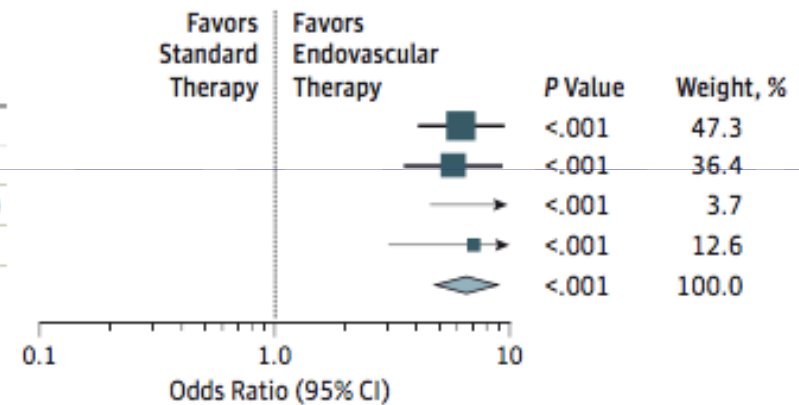
$I^2 = 17.7\%$ ,  $P = .29$



**C** Revascularization at 24 h

Source	Endovascular Therapy Events/No.	Standard Therapy Events/No.	Odds Ratio (95% CI)
MR CLEAN, <sup>29</sup> 2015	141/187	68/207	6.27 (4.03-9.74)
ESCAPE, <sup>30</sup> 2015	113/156	43/138	5.81 (3.51-9.60)
EXTEND-IA, <sup>31</sup> 2015	33/35	15/35	22.00 (4.55-106.43)
SWIFT-PRIME, <sup>32</sup> 2015	53/64	21/52	7.11 (3.03-16.70)
Overall	340/442	147/432	6.49 (4.79-8.79)

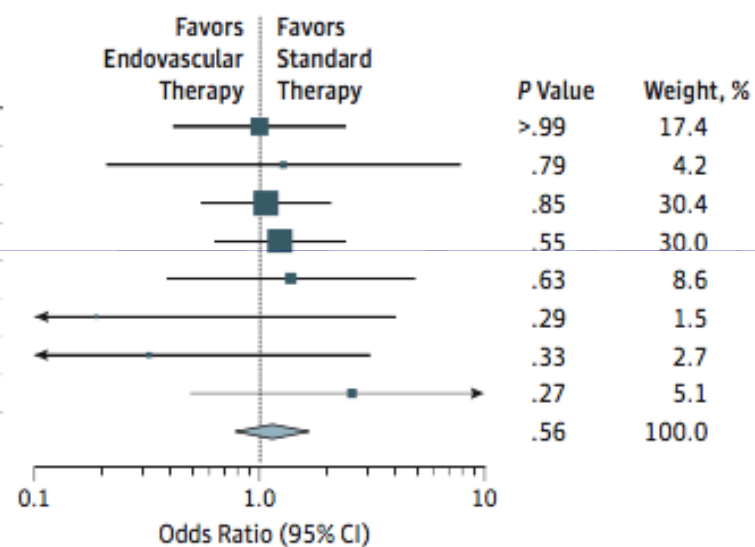
$I^2 = 0.0\%$ ,  $P = .46$



**D** Symptomatic intracranial hemorrhage within 90 d

Source	Endovascular Therapy Events/No.	Standard Therapy Events/No.	Odds Ratio (95% CI)
SYNTHESIS, <sup>26</sup> 2013	10/181	10/181	1.00 (0.41-2.46)
MR RESCUE, <sup>27</sup> 2013	3/64	2/54	1.28 (0.21-7.95)
IMS III, <sup>28</sup> 2013	27/434	13/222	1.07 (0.54-2.11)
MR CLEAN, <sup>29</sup> 2015	18/233	17/267	1.23 (0.62-2.45)
ESCAPE, <sup>30</sup> 2015	6/165	4/150	1.38 (0.38-4.98)
EXTEND-IA, <sup>31</sup> 2015	0/35	2/35	0.19 (0.01-4.08)
SWIFT-PRIME, <sup>32</sup> 2015	1/98	3/97	0.32 (0.03-3.16)
REVASCAT, <sup>33</sup> 2015	5/103	2/103	2.58 (0.49-13.59)
Overall	70/1313	53/1109	1.12 (0.77-1.63)

$I^2 = 0.0\%$ ,  $P = .82$



# Trombectomia Endovascular

Pacientes devem receber tratamento endovascular com *stent retriever* se preencher todos os critérios a seguir:

(classe IA)

- (a) mRS 0-1,
- (b) r-tPA IV dentro de 4.5 h da instalação,
- (c) oclusão da ACI ou ACM proximal (M1),
- (d) idade  $\geq 18$  anos,
- (e) NIHSS  $\geq 6$ ,
- (f) ASPECTS  $\geq 6$ ,
- (g) punção arterial  $< 6$  horas da instalação dos sintomas

# Considerações

- > *Baixa taxa de recanalização com rTPA IV*
  - > 44% ramos distais da ACM
  - > 24 - 29% ramos proximais ACM
  - > 10% porção terminal ACI
- > *Maior risco de hemorragia intracraniana*
- > *Fragmentar o trombo*
- > *Impedir uso de antitrombótico*
- > *Custo*



# Considerações

- > *Aumentar a velocidade e probabilidade de reperfusão*
- > *Reperfusion*
- > *Mais disponível*




JAMA Neurology | **Original Investigation**

# Combined Intravenous Thrombolysis and Thrombectomy vs Thrombectomy Alone for Acute Ischemic Stroke

## A Pooled Analysis of the SWIFT and STAR Studies

Jonathan M. Coutinho, MD; David S. Liebeskind, MD; Lee-Anne Slater, MD; Raul G. Nogueira, MD; Wayne Clark, MD; Antoni Dávalos, MD; Alain Bonafé, MD; Reza Jahan, MD; Urs Fischer, MD; Jan Gralla, MD; Jeffrey L. Saver, MD; Vitor M. Pereira, MD

 *Therapeutic Advances in Neurological Disorders*

*Original Research*

## Endovascular thrombectomy with or without systemic thrombolysis?

Georgios Tsivgoulis, Aristeidis H. Katsanos, Dimitris Mavridis, Anne W. Alexandrov, Georgios Magoufis, Adam Arthur, Valeria Caso, Peter D. Schellinger and Andrei V. Alexandrov

*Ther Adv Neurol Disord*

2017, Vol. 10(3) 151–160

DOI: 10.1177/

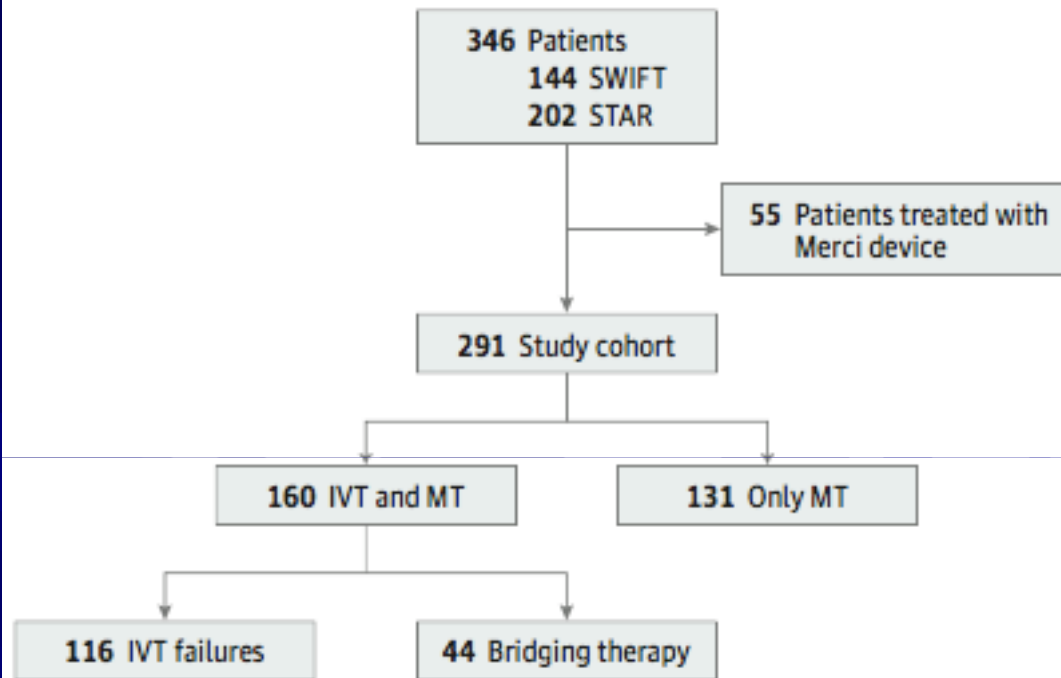
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**Figure. Flowchart of Patient Selection**



A total of 346 patients were enrolled in the Solitaire With the Intention for Thrombectomy (SWIFT) (n = 144) and Solitaire Flow Restoration Thrombectomy for Acute Revascularization (STAR) (n = 202) clinical trial studies, of whom 55 patients were excluded from the analysis because they were not treated with the Solitaire FR (flow restoration) stent retriever. The remaining 291 patients comprised the analysis population.

**Table 2. Baseline Characteristics of the Study Patients<sup>a</sup>**

Characteristic	MT and IVT (n = 160)	MT Alone (n = 131)	P Value
Age, mean (SD), y	67 (13)	69 (12)	.14
Female	97/160 (60.6)	73/131 (55.7)	.41
NIHSS, median (IQR)	17 (13-20)	17 (13-20)	.86
Medical history			
Atrial fibrillation	53/160 (33.1)	62/131 (47.3)	.02
Hypertension	99/160 (61.9)	87/131 (66.4)	.46
Diabetes	22/160 (13.8)	32/131 (24.4)	.02
Hyperlipidemia	69/160 (43.1)	57/131 (43.5)	>.99
Current smoker	21/160 (13.1)	19/131 (14.5)	.74
Prior stroke or TIA	25/160 (15.6)	30/131 (22.9)	.13
Antiplatelet use	37/160 (23.1)	40/131 (30.5)	.18
Systolic blood pressure, mean (SD), mm Hg	145 (23)	147 (25)	.49
Diastolic blood pressure, mean (SD), mm Hg	80 (15)	80 (15)	.86
Left side occlusion	78/157 (49.7)	64/129 (49.6)	>.99
ASPECTS, mean (SD)	8.1 (1.8)	8.5 (1.6)	.03
ASPECTS, median (IQR)	8.0 (7.0-10.0)	9.0 (8.0-10.0)	.04
Location of occlusion			
Carotid	31/153 (20.3)	23/129 (17.8)	.72
M1	99/153 (64.7)	88/129 (68.2)	
M2 or M3	23/153 (15.0)	17/129 (13.2)	
Posterior circulation	0/153 (0)	1/129 (0.8)	
Serum glucose, mean (SD), mg/dL	126 (50)	130 (64)	.56
Platelets, mean (SD), $\times 10^3/\mu\text{L}$	228 (74)	239 (85)	.23





Table 3. Details of Procedural, Clinical, and Safety Outcomes<sup>a</sup>

Variable	MT and IVT (n = 160)	MT Alone (n = 131)	P Value
Times, median (IQR), min			
Symptom onset to hospital arrival	171 (75-245)	190 (108-274)	.04
Symptom onset to groin puncture	254 (195-305)	262 (201-375)	.10
Hospital arrival to groin puncture	79 (49-111)	77 (54-120)	.46
Symptom onset to reperfusion	308 (253-361)	315 (242-424)	.15
No. of passes with stent retriever, mean (SD)	1.7 (0.9)	1.8 (1.0)	.28
No. of passes with stent retriever, median (range)	1 (1-5)	1 (1-7)	.30
mTICI 2b or 3 reperfusion	127/151 (84.1)	105/124 (84.7)	>.99
mTICI 3	86/151 (57.0)	66/124 (53.2)	.54
Rescue therapy	20/160 (12.5)	17/131 (13.0)	>.99
Complications			
Emboli to uninvolved territory	7/156 (4.5)	3/126 (2.4)	.52
Device-related serious adverse events	8/160 (5.0)	8/131 (6.1)	.80
Vasospasm	43/160 (26.9)	18/131 (13.7)	.006
sICH	2/160 (1.1)	5/131 (3.8)	.25
SAH	2/160 (1.1)	4/131 (3.1)	.41
PH1	1/160 (0.6)	4/131 (3.1)	.18
PH2	1/160 (0.6)	2/131 (1.5)	.59
HI1	29/160 (18.1)	25/131 (19.1)	.88
HI2	19/160 (11.9)	11/131 (8.4)	.44
Remote ICH	1/160 (0.6)	0/131 (0)	>.99
Vessel perforation	0/160 (0)	1/131 (0.8)	.45
Groin hematoma	3/160 (1.9)	2/131 (1.5)	>.99
Outcome at 90 d			
mRS score of 0-1 <sup>b</sup>	65/156 (41.7)	46/128 (35.9)	.33
mRS score of 0-2 <sup>b</sup>	90/156 (57.7)	61/128 (47.7)	.10
Mortality	13/160 (8.1)	16/131 (12.2)	.32



**Table 4. Multivariate Analyses**

Variable	No. (%) of Patients		OR (95% CI)	
	MT and IVT (n = 160)	MT Alone (n = 131)	Unadjusted	Adjusted
<b>Times<sup>a</sup></b>				
Hospital arrival to groin puncture ≤90 min	97/156 (62.2)	72/121 (59.5)	1.12 (0.69-1.82)	1.63 (0.83-3.21)
Groin puncture to reperfusion ≤45 min	82/152 (53.9)	59/118 (50.0)	1.17 (0.72-1.90)	1.31 (0.75-2.29)
<b>Technical details of the MT procedure<sup>b</sup></b>				
mTICI 2b or 3	127/151 (84.1)	105/124 (84.7)	0.96 (0.50-1.84)	0.68 (0.28-1.66)
mTICI 3	86/151 (57.0)	66/124 (53.2)	1.16 (0.72-1.87)	1.38 (0.76-2.51)
>3 Passes with stent retriever	30/132 (22.7)	30/120 (25.0)	0.88 (0.49-1.58)	0.90 (0.44-1.85)
<b>Procedural complications<sup>b</sup></b>				
sICH	2/160 (1.3)	5/131 (3.8)	0.32 (0.06-1.67)	0.03 (0.00-1.28)
Emboli to uninvolved territory	7/156 (4.5)	3/126 (2.4)	1.93 (0.49-7.61)	4.12 (0.75-22.54)
Vasospasm	40/160 (25.0)	17/131 (13.0)	2.24 (1.20-4.17)	1.41 (0.58-3.42)
<b>Outcome at 90 d<sup>c</sup></b>				
mRS scores of 0-2 <sup>d</sup>	90/156 (57.7)	61/128 (47.7)	1.50 (0.94-2.40)	1.48 (0.80-2.74)
Mortality	13/160 (8.1)	16/131 (12.2)	0.64 (0.29-1.37)	0.90 (0.35-2.30)

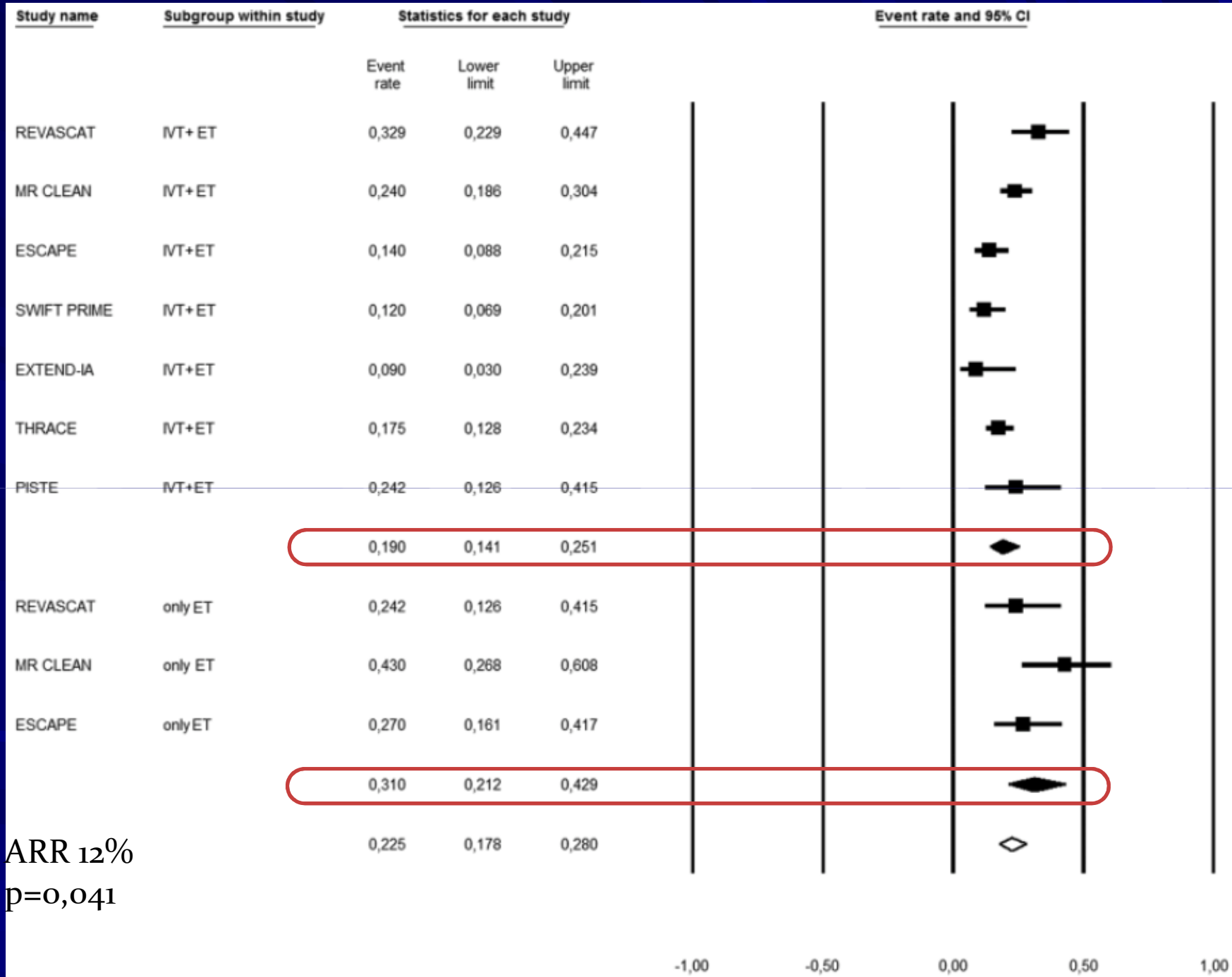


**Table 1.** Baseline characteristics of randomized controlled trials included in the meta-analysis.

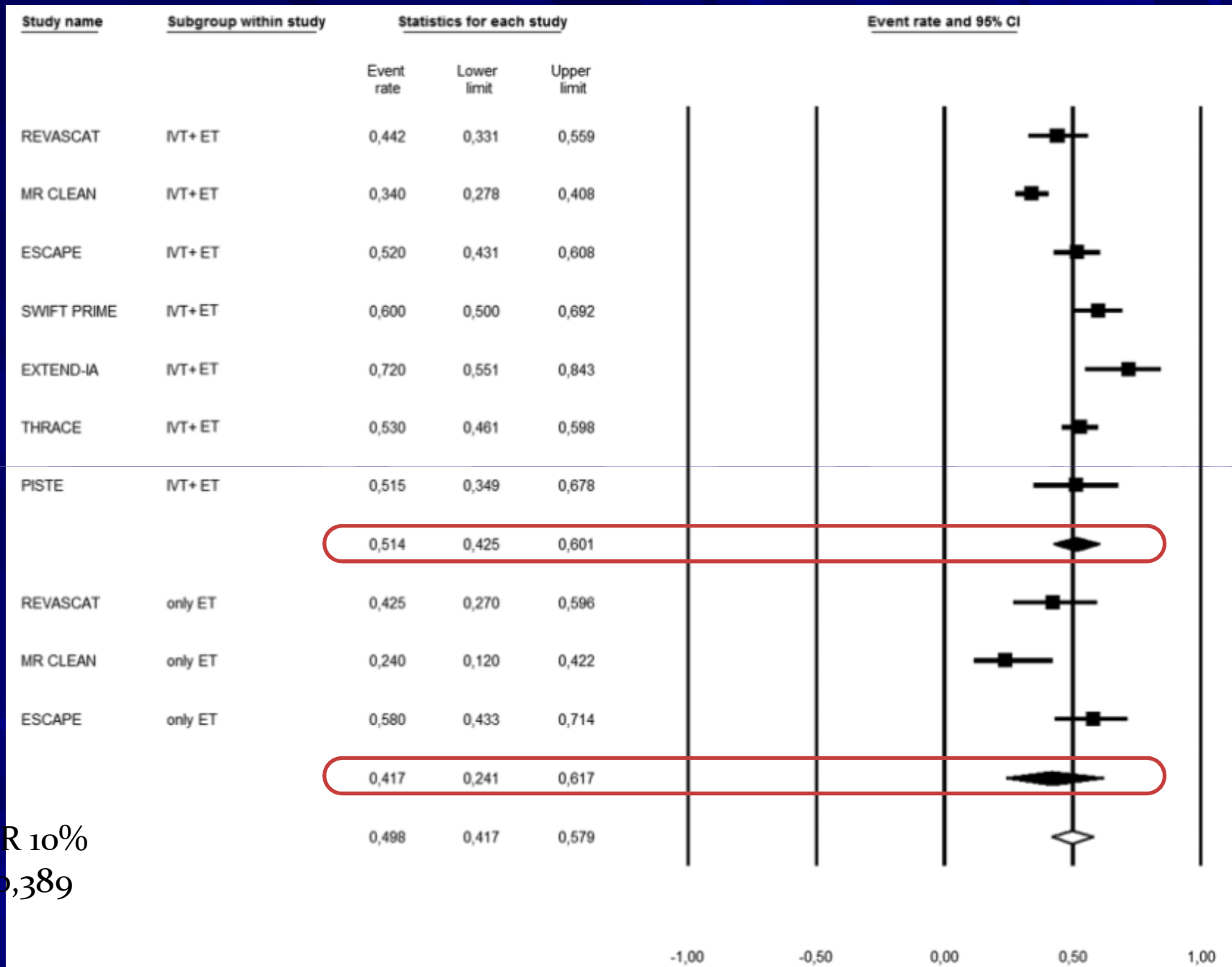
Study name	Patients	Mean age (years)	Males (%)	Median NIHSS (IQR) or (range)**	ET (n, %*)	IVT (n, %**)
ESCAPE	315	70.5	47.6%	16 (13–20)	165 (52%)	No: 45 (27%) Yes: 120 (73%)
EXTEND-IA	70	69.4	49%	17 (13–20)	35 (50%)	Yes: 35 (100%)
MR CLEAN	500	65	58.3%	17 (14–21)	233 (47%)	No: 30 (13%) Yes: 203 (87%)
PISTE	65	65.5	44.6%	18 (6–24)	33 (51%)	Yes: 33 (100%)
REVASCAT	206	66.4	52.3%	17 (14–20)	103 (50%)	No: 33 (32%) Yes: 70 (68%)
SWIFT-PRIME	196	65.7	50.5%	17 (13–20)	98 (50%)	Yes: 98 (100%)
THRACE	412	62.8	53.4%	18 (15–21)	204 (49.5%)	Yes: 204 (100%)

ET, endovascular thrombectomy; IQR, interquartile range; IVT, intravenous thrombolysis; NIHSS, National Institute of Health Stroke Scale.

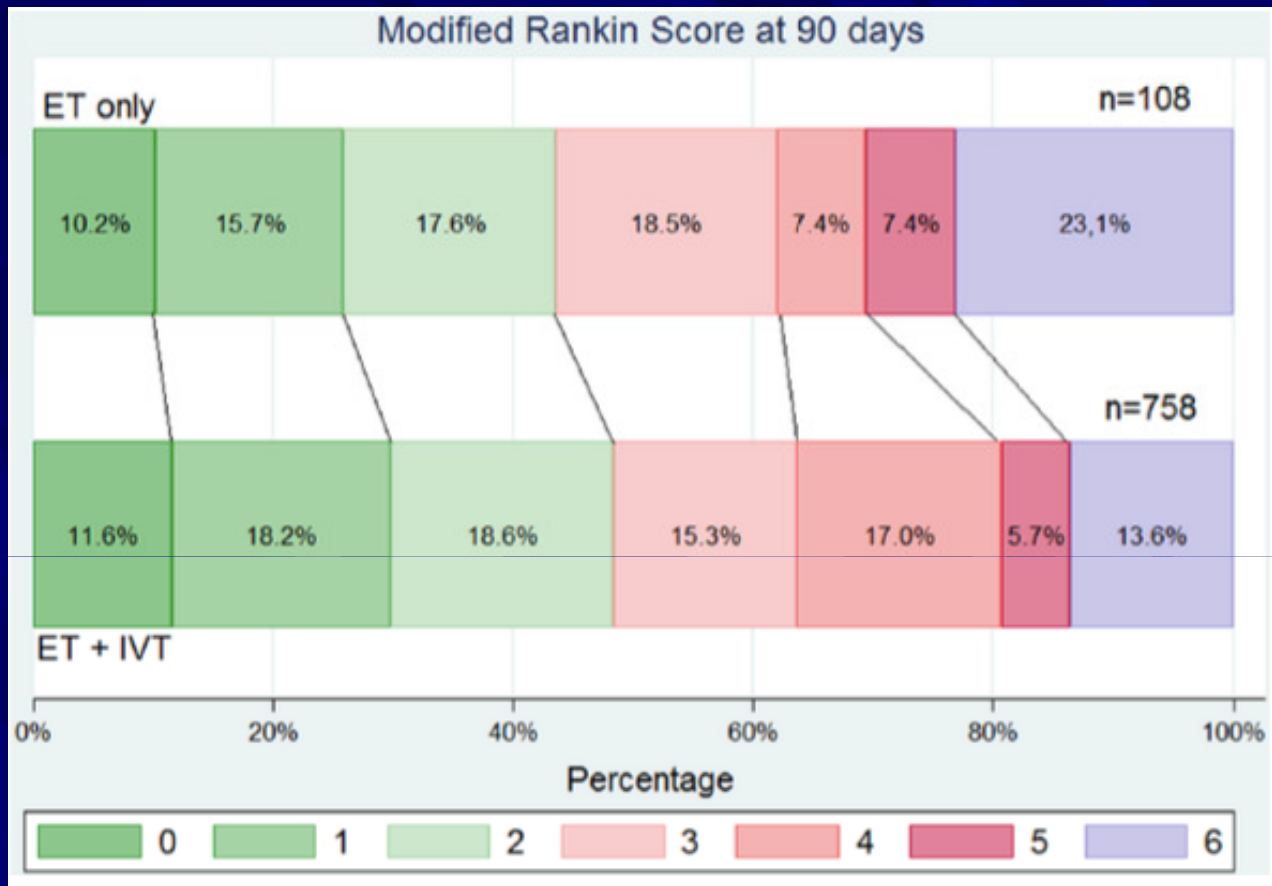
\*among all patients; \*\*among patients randomized to ET.



ARR 12%  
p=0,041



ARR 10%  
p=0,389



# Conclusões

- › *Pacientes sem evidência de LVO deve ser submetido a trombólise IV*
- › *Contraindicação a IVT, ex.: uso de anticoagulantes, cirurgias recentes, história de HIC ou > 4,5 h do início dos sintomas e LVO devem ser tratados apenas com trombectomia endovascular*
- › *IVT deve ser oferecido sem retardar acesso a trombectomia*
- › *Alguns ensaios clínicos com esse propósito já estão planejados. O SWIFT DIRECT, do grupo canadense em colaboração com um time suíço. E ao menos outros dois.*





# AVC 2017

XI CONGRESSO BRASILEIRO  
DE DOENÇAS CEREBROVASCULARES

5 A 7 DE OUTUBRO

BAHIA OTHON PALACE HOTEL



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Bahia

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