THROMBECTOMIE:ACTUALITÉS

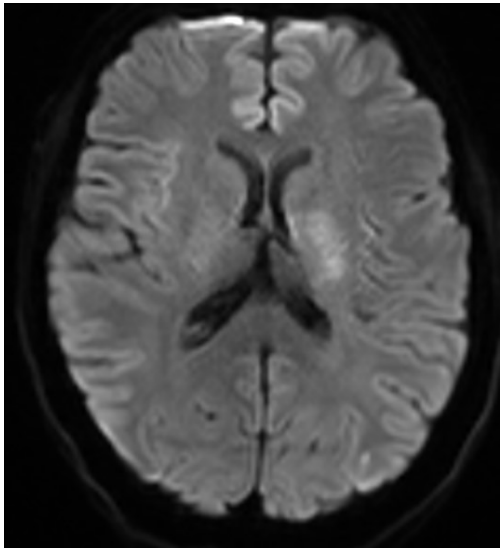
Prof. Mikael Mazighi

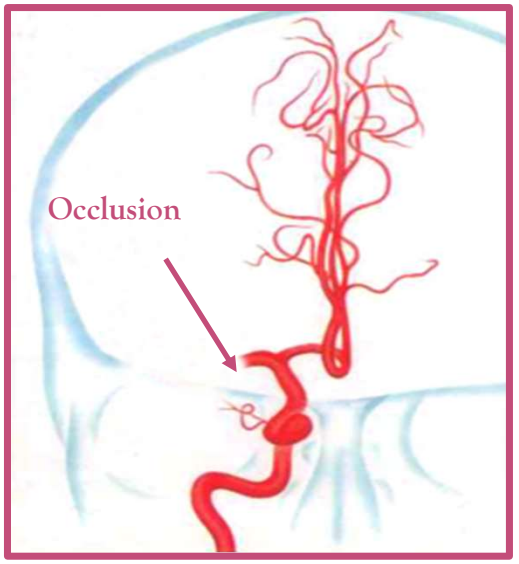
Depts Neurologie Lariboisière Hospital-APHP Nord, neuroradiologie interventionnelle, Hôpital Fondation de Rothschild, Paris.

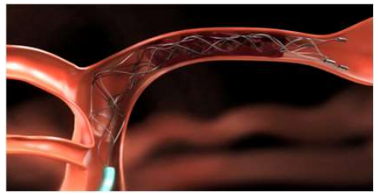
LIENS D'INTÉRÊT

- (bourses[1], présentations[2], consultant[3], congrès[4], autres[5])
  - Fondation AVC[1]
  - Fondation de l'AVENIR[1]
  - Agence Nationale de la Recherche[1]
  - Ministère de la santé[5]
  - Boehringer[3,4]
  - Air Liquide[3]
  - Acticor[3]
  - Novonordisk[3]
  - Alexion[3]

AVC &OCCLUSION ARTÉRIELLE







Guideline

EUROPEAN STROKE JOURNAL

European Stroke Organisation (ESO) – European Society for Minimally Invasive Neurological Therapy (ESMINT) guidelines on mechanical thrombectomy in acute ischaemic stroke

Endorsed by Stroke Alliance for Europe (SAFE)

TRAITEMENT DE RÉFÉRENCE= THROMBOLYSE IV + THROMBECTOMIE

Guideline

EUROPEAN STROKE JOURNAL

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2022, Vol. 7(1) I–XXVI
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DOI: 10.1177/23969873221076968
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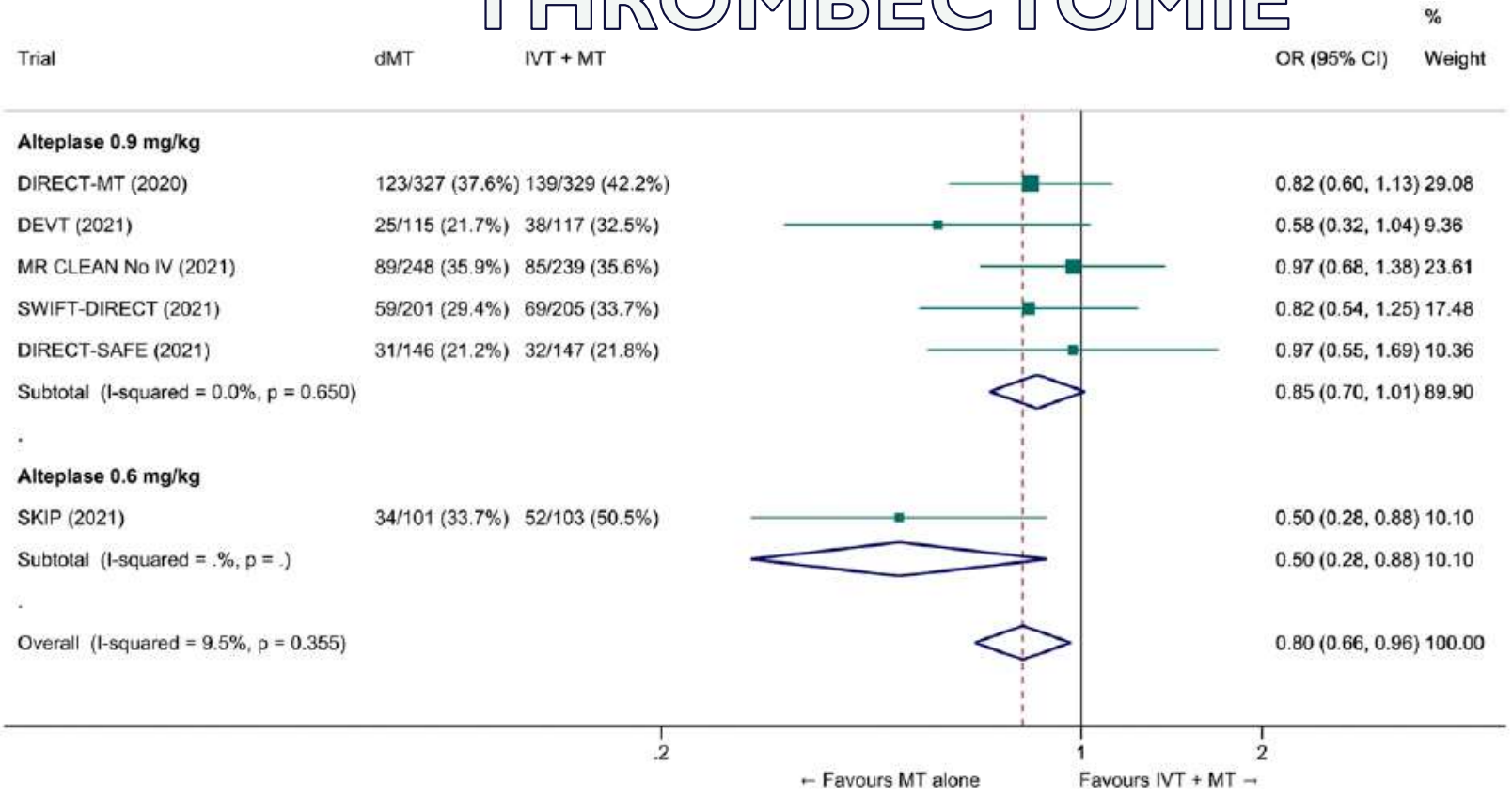
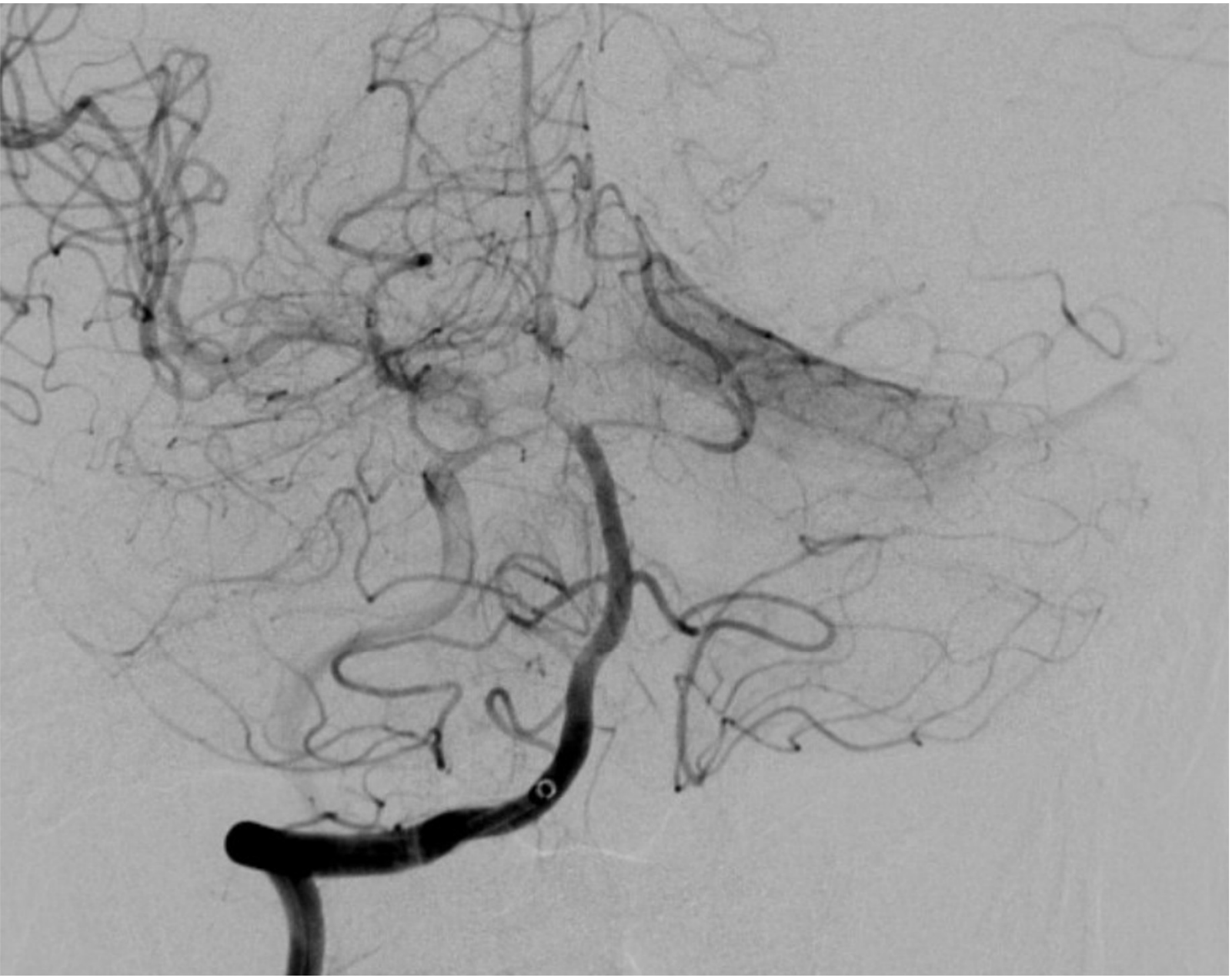
SAGE

European Stroke Organisation – European Society for Minimally Invasive Neurological Therapy expedited recommendation on indication for intravenous thrombolysis before mechanical thrombectomy in patients with acute ischaemic stroke and anterior circulation large vessel occlusion

Guillaume Turc[1], Georgios Tsivgoulis[2,3], Heinrich J. Audebert[4], Hieronymus Boogaarts[5], Pervinder Bhogal[6], Gian Marco De Marchis[7], Ana Catarina Fonseca[8], Pooja Khatri[9], Mikaël Mazighi[10,11], Natalia Pérez de la Ossa[12], Peter D. Schellinger[13], Daniel Strbian[14], Danilo Toni[15], Philip White[16], William Whiteley[17], Andrea Zini[18], Wim van Zwam[19], and Jens Fiehler[20]



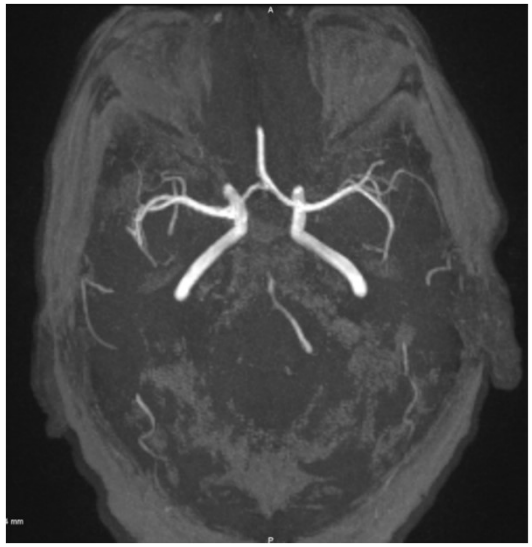


OCCLUSIONS ARTÈRE BASILAIRE

OCCLUSION ARTÈRE BASILAIRE

Expert opinion on mechanical thrombectomy for basilar artery occlusion

There is a consensus among the panel (11/11 votes) that in analogy to anterior circulation large vessel occlusion and with regard to the grim natural course of basilar artery occlusions, the therapeutic approach with intravenous thrombolysis plus mechanical thrombectomy should strongly be considered.



European Stroke Organisation (ESO) - European Society for Minimally Invasive Neurological Therapy (ESMINT) Guidelines on Mechanical Thrombectomy in Acute Ischemic Stroke

Guillaume Turc,[1,2,3,4] Pervinder Bhogal,[5] Urs Fischer,[6] Pooja Khatri,[7] Kyriakos Lobotesis,[8] Mikaël Mazighi,[3,9,10,11] Peter D. Schellinger,[12] Danilo Toni,[13] Joost de Vries,[14] Philip White,[15] Jens Fiehler[16]

Endovascular treatment versus standard medical treatment for vertebrobasilar artery occlusion (BEST): an open-label, randomised controlled trial

Xinfeng Liu, Qiliang Dai, Ruidong Ye, Wenjie Zi, Yuxiu Liu, Huaiming Wang, Wusheng Zhu, Minmin Ma, Qin Yin, Min Li, Xinying Fan, Wen Sun, Yunfei Han, Qiushi Lv, Rui Liu, Dong Yang, Zhonghua Shi, Dequan Zheng, Xiaorong Deng, Yue Wan, Zhen Wang, Yu Geng, Xingyu Chen, Zhiming Zhou, Geng Liao, Ping Jin, Yumin Liu, Xintong Liu, Meng Zhang, Feng Zhou, Hongchao Shi, Yunfeng Zhang, Fuqiang Guo, Congguo Yin, Guozhong Niu, Mei Zhang, Xueli Cai, Qiyi Zhu, Zhonglun Chen, Yingchun Liang, Bing Li, Min Lin, Wei Wang, Haowen Xu, Xinmin Fu, Wenhua Liu, Xiguang Tian, Zili Gong, Haicun Shi, Chuanming Wang, Penghua Lv, Zhonghai Tao, Liangfu Zhu, Shiquan Yang, Wei Hu, Pingzhou Jiang, David S Liebeskind, Vitor M Pereira, Thomas Leung, Bernard Yan, Stephen Davis, Gelin Xu, Raul G Nogueira*, on behalf of the BEST Trial Investigators†*

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

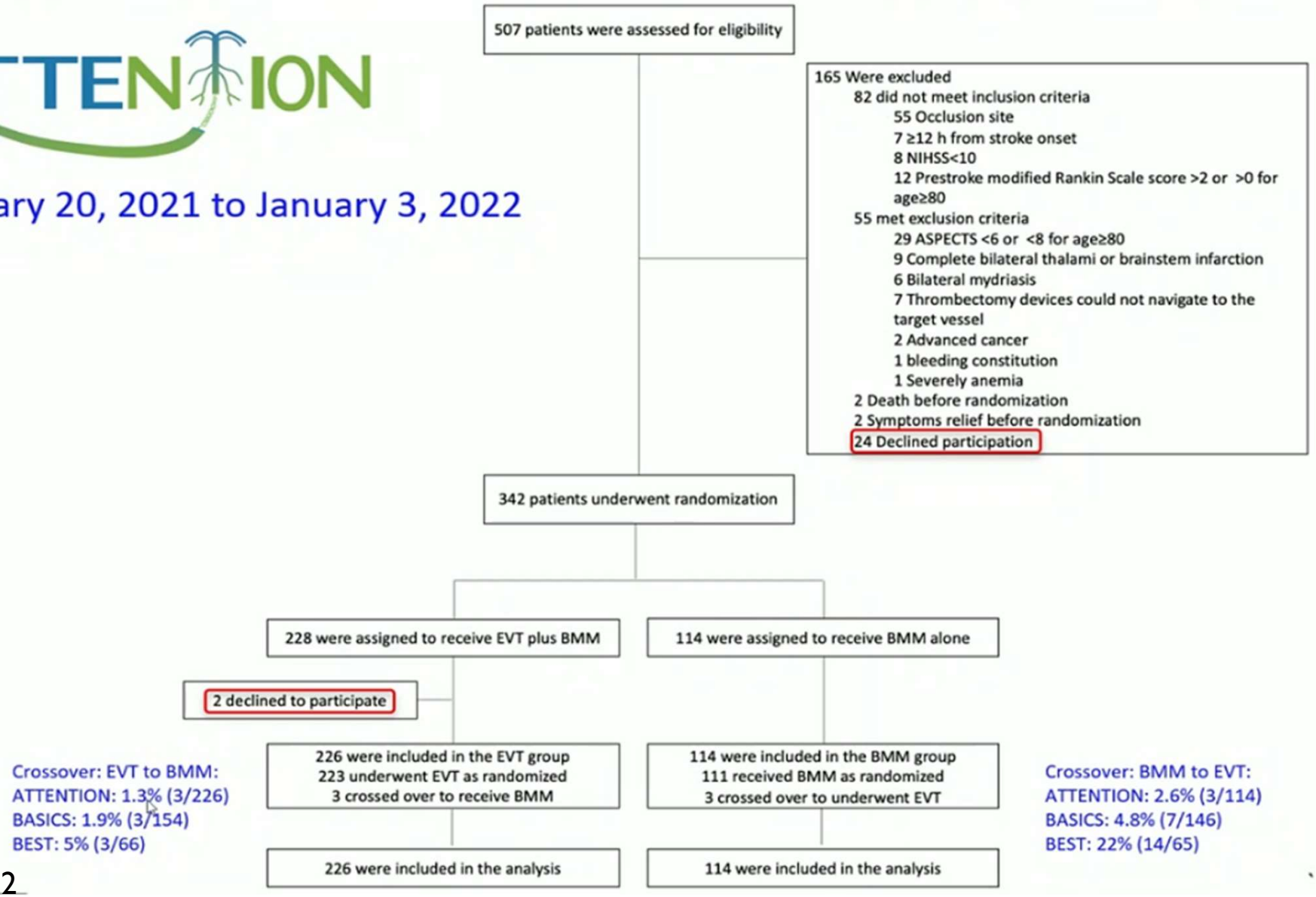
Endovascular Therapy for Stroke Due to Basilar-Artery Occlusion

ATTENTION Study

BAOCHE Study

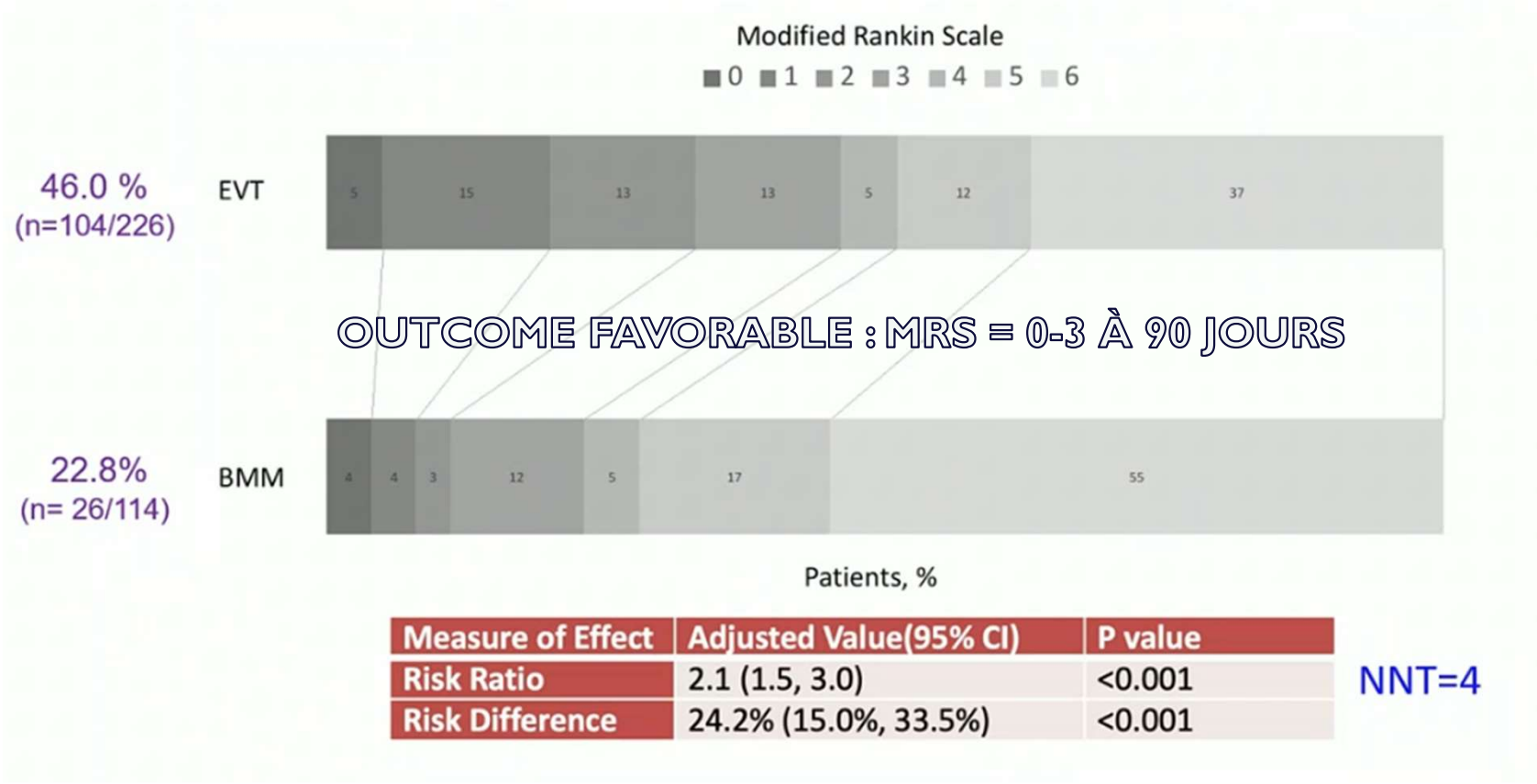
ATTENTION

February 20, 2021 to January 3, 2022



ESOC 2022

RÉSULTATS – CRITÈRE DE JUGEMENT PRINCIPAL



Measure of Effect	Adjusted Value(95% CI)	P value
Risk Ratio	2.1 (1.5, 3.0)	<0.001
Risk Difference	24.2% (15.0%, 33.5%)	<0.001

NNT=4

ESOC 2022

TRAITEMENT ENDOVASCULAIRE

Characteristic	EVT (N = 226)
Stent retriever only	11 (4.9%)
Aspiration only	77 (34.1%)
Combined technique	110 (48.7%)
Intracranial angioplasty/stenting	**88 (38.9%)**
Extracranial angioplasty/stenting	**18 (8.0%)**
Intra-arterial thrombolysis	12 (5.3%)
Final mTICI. 2b or 3-no./total no. (%)	**208/223 (93.3%)**

TICI 2b ou 3 % :
BASICS : 72
BEST : 71

ESOC 2022

RÉSULTATS – CRITÈRES DE SÉCURITÉ

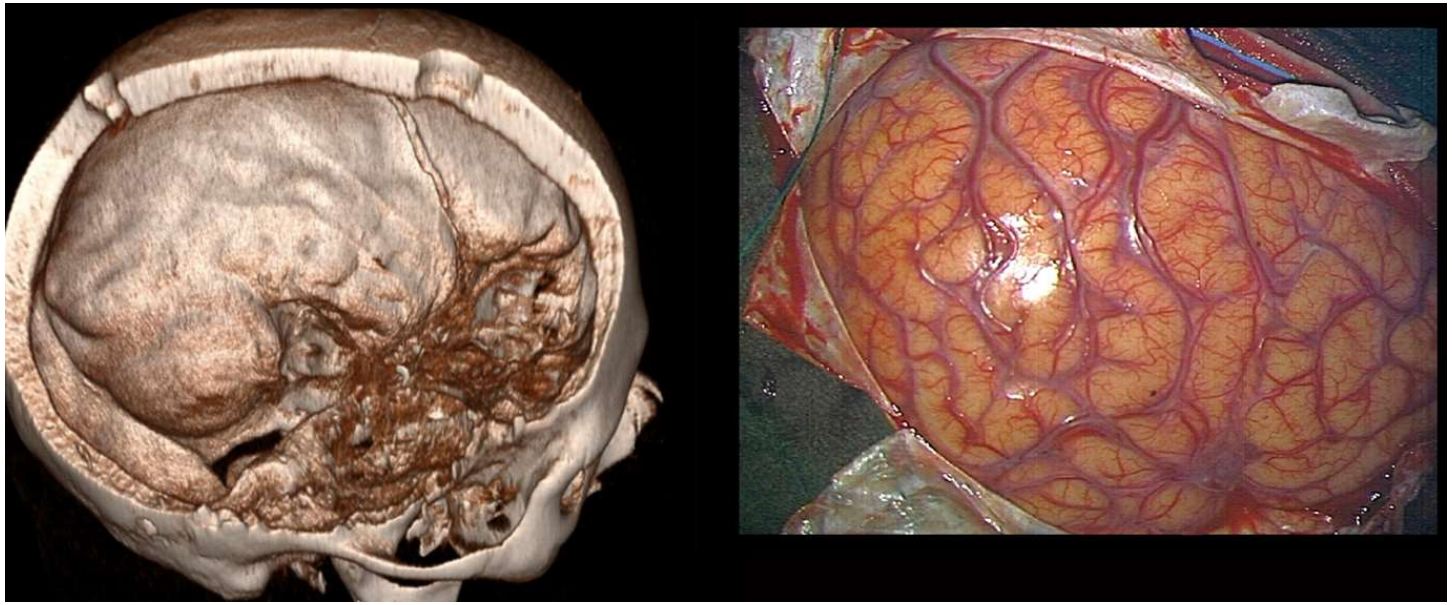
Outcome	EVT (N = 226)	BMM (N = 114)	Measure of effect	Adjusted Value (95% CI)	P value
Imaging Outcomes					
Patency at 24-72 hr on CTA/MRA — no./total no. (%)	148/162 (91.4)	26/69 (37.7)	Risk ratio	2.5 (1.9, 3.5)	<0.001
Asymptomatic Intracranial hemorrhage at 24-72h-no. (%)	19 (8.4)	2 (1.8)	Risk ratio	4.5 (1.0, 19.3)	0.054
Safety outcomes					
Death — no. (%)	83 (36.7)	63 (55.3)	Risk ratio	0.7 (0.5, 0.8)	<0.001
Symptomatic ICH (SIT-MOST criteria) at 24-72 h, No. (%)	12 (5.3)	0	Risk difference	5.3% (2.3%, 8.2%)	0.001

Mortalité % :
BASICS : 38 vs 43
BEST : 33 vs 36

Hémorragie intracrânienne symptomatique % :
BASICS : 4.5 vs 0.7
BEST : 8 vs 0

ESOC 2022

GROS VOLUMES



GROS VOLUMES?

Expert opinion on mechanical thrombectomy in patients with low ASPECTS or large infarct volume

If inclusion of the patient in a dedicated randomised controlled trial is not possible, we suggest that treatment with mechanical thrombectomy may be reasonable on an individual basis in selected cases with ASPECTS <6 or core volume >70 mL (11/11 experts agree). Patient selection criteria might include age, severity and type of neurological impairment, time since symptom onset, location of the ischaemic lesion on plain CT scanner or MRI and results of advanced imaging, notably perfusion-core mismatch.

Guideline

EUROPEAN STROKE JOURNAL

European Stroke Organisation (ESO) – European Society for Minimally Invasive Neurological Therapy (ESMINT) guidelines on mechanical thrombectomy in acute ischaemic stroke

Endorsed by Stroke Alliance for Europe (SAFE)

European Stroke Journal
0(0) 1–47

ORIGINAL ARTICLE

This article was published on February 9, 2022, at NEJM.org.

DOI: 10.1056/NEJMoa2118191

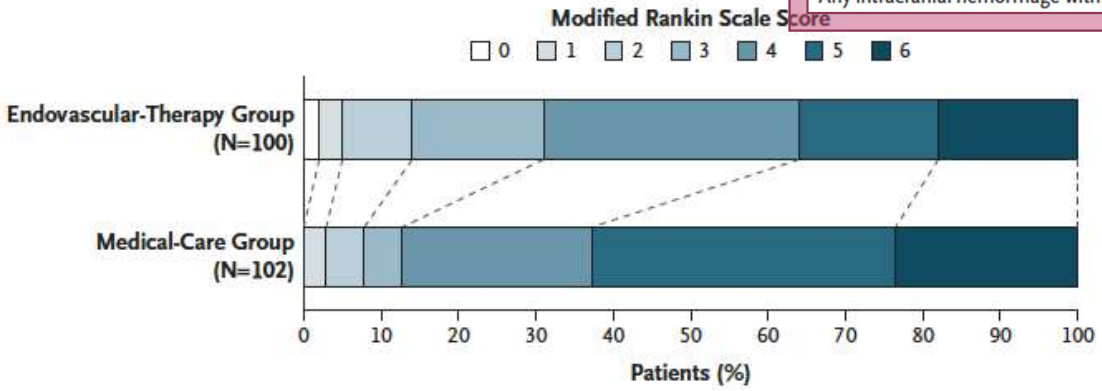
Endovascular Therapy for Acute Stroke with a Large Ischemic Region

S. Yoshimura, N. Sakai, H. Yamagami, K. Uchida, M. Beppu, K. Toyoda, Y. Matsumaru, Y. Matsumoto, K. Kimura, M. Takeuchi, Y. Yazawa, N. Kimura, K. Shigeta, H. Imamura, I. Suzuki, Y. Enomoto, S. Tokunaga, K. Morita, F. Sakakibara, N. Kinjo, T. Saito, R. Ishikura, M. Inoue, and T. Morimoto

NIHSS >6

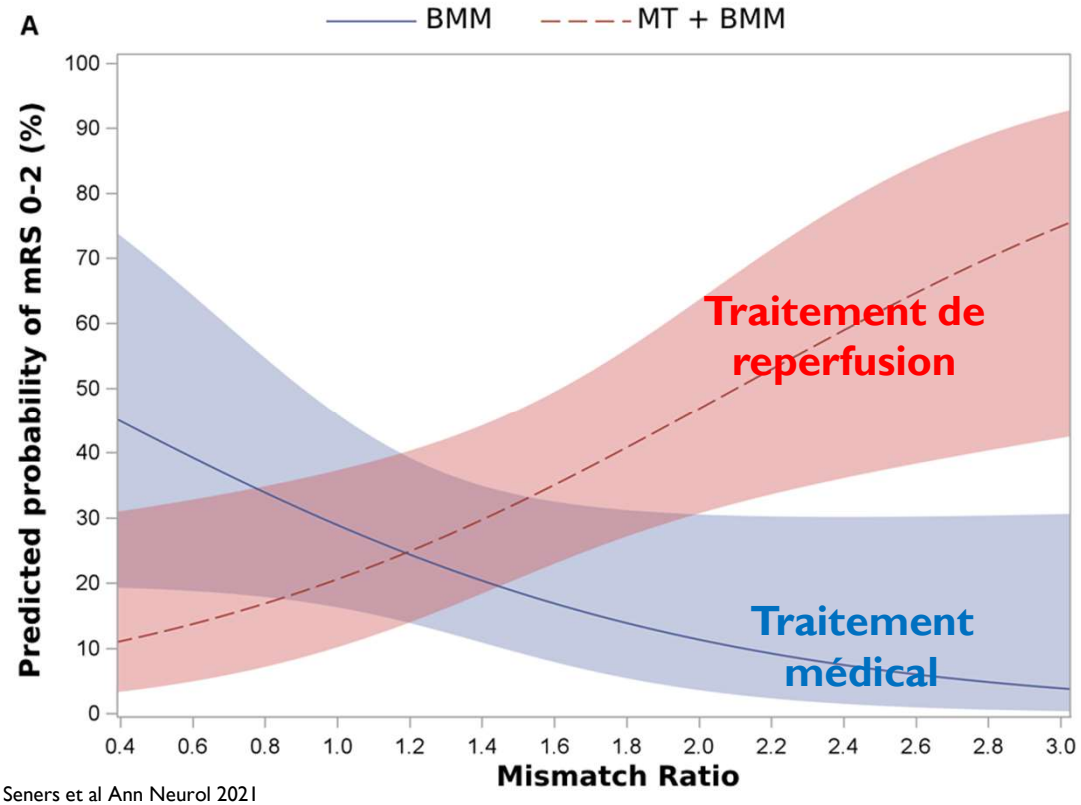
ASPECTS 3-5 scan ou IRM

Outcome	Endovascular-Therapy Group (N=100)	Medical-Care Group (N=102)	Treatment Effect (95% CI)*	P Value
	number (percent)			
Primary outcome				
Modified Rankin scale score of 0 to 3 at 90 days	31 (31.0)	13 (12.7)	2.43 (1.35–4.37)	0.002
Secondary outcomes				
Modified Rankin scale score of 0 to 2 at 90 days	14 (14.0)	7 (6.9)	2.04 (0.86–4.84)	
Modified Rankin scale score of 0 or 1 at 90 days	5 (5.0)	3 (2.9)	1.70 (0.42–6.93)	
Ordinal shift across the range of modified Rankin scale scores toward a better outcome	NA	NA	2.42 (1.46–4.01)	
Improvement of ≥8 points on the NIHSS at 48 hr	31 (31.0)	9 (8.8)	3.51 (1.76–7.00)	
Safety outcomes				
Symptomatic intracranial hemorrhage within 48 hr	9 (9.0)	5 (4.9)	1.84 (0.64–5.29)	0.25
Any intracranial hemorrhage within 48 hr	58 (58.0)	32 (31.4)	1.85 (1.33–2.58)	<0.001

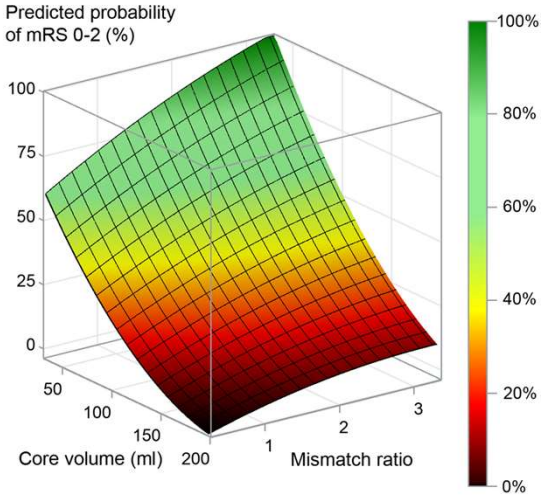


Modified Rankin Scale Score at 90 Days	0	1	2	3	4	5	6
Endovascular-therapy group — no. (%)	2 (2.0)	3 (3.0)	9 (9.0)	17 (17.0)	33 (33.0)	18 (18.0)	18 (18.0)
Medical-care group — no. (%)	0	3 (2.9)	5 (4.9)	5 (4.9)	25 (24.5)	40 (39.2)	24 (23.5)

OPTIMISER LA SÉLECTION DES PATIENTS

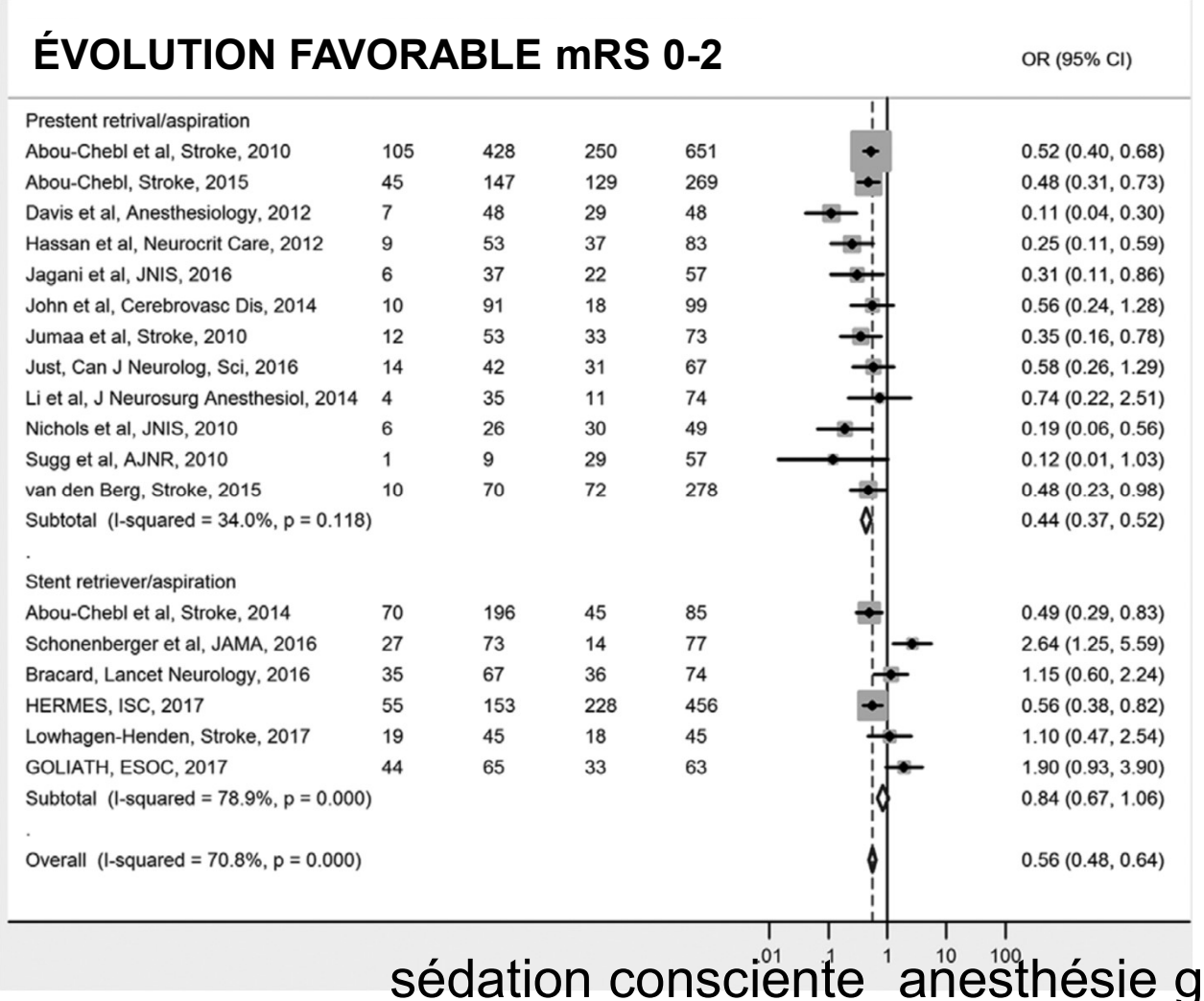


Seners et al Ann Neurol 2021



L'ANESTHÉSIE

LA TECHNIQUE D'ANESTHÉSIE …



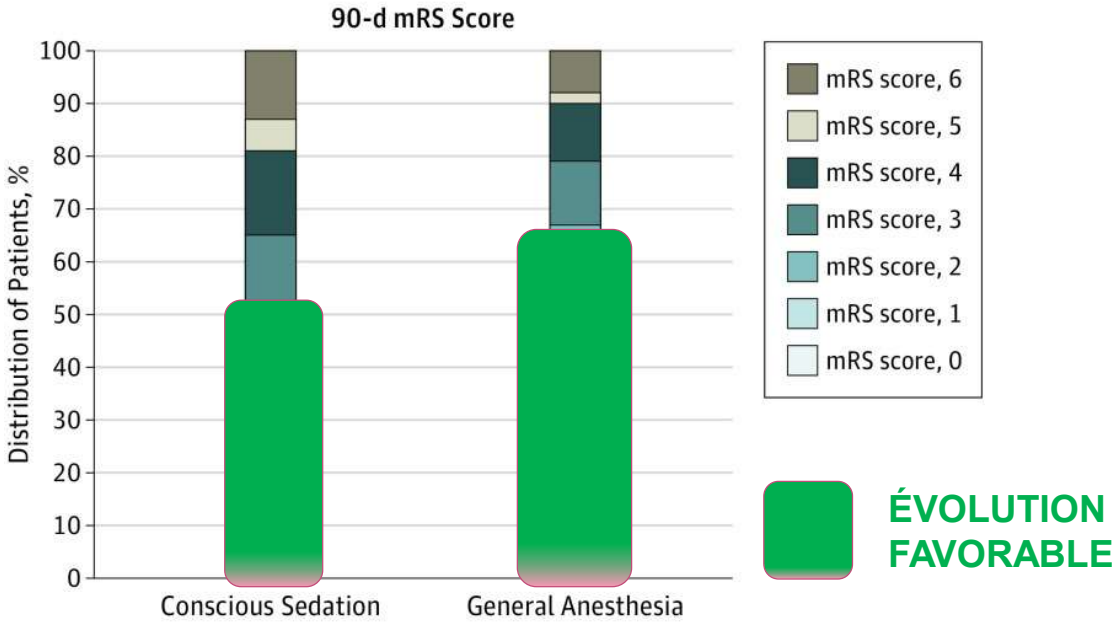
	OR; GA vs Non-GA	95% CI
Death at 3 mo	2.02	1.66–2.45
Modified Rankin Scale score ≤2 at 90 d	0.58	0.48–0.64
Successful recanalization	1.04	0.83–1.31
sICH	1.31	1.01–1.70
Other vascular complications	1.43	1.01–2.03
Respiratory complications	1.70	1.22–2.37

sédation consciente anesthésie générale

Brinjikji et al Stroke 2017

L'AG FAIT MIEUX?

CRITÈRES DE JUGEMENT



ÉVOLUTION FAVORABLE

Outcome	General Anesthesia (n = 65)	Conscious Sedation (n = 63)	*P* Value
Successful reperfusion (mTICI 2b-3), No. (%)	50 (76.9)	38 (60.3)	.04
Acute infarct volume, median (IQR), mL	10.5 (2.4-23.6)	13.3 (5.2-31.1)	.26
Final infarct volume, median (IQR), mL	22.3 (8.1-64.5)	38.0 (16.7-128.0)	.04
Infarct volume growth, median (IQR), mL	8.2 (2.2-38.6)	19.4 (2.4-79.0)	.10
90-d mRS score, median (IQR)	2 (1-3)	2 (1-4)	.04
NIHSS score in 24 h, median (IQR)	6 (3-14)	10 (2-19)	.19
Change in NIHSS score after 24 h, median (IQR)	−10 (−14 to −5)	−7 (−13 to 0)	.11

JAMA Neurol. 2018 Apr; 75(4): 470–477.

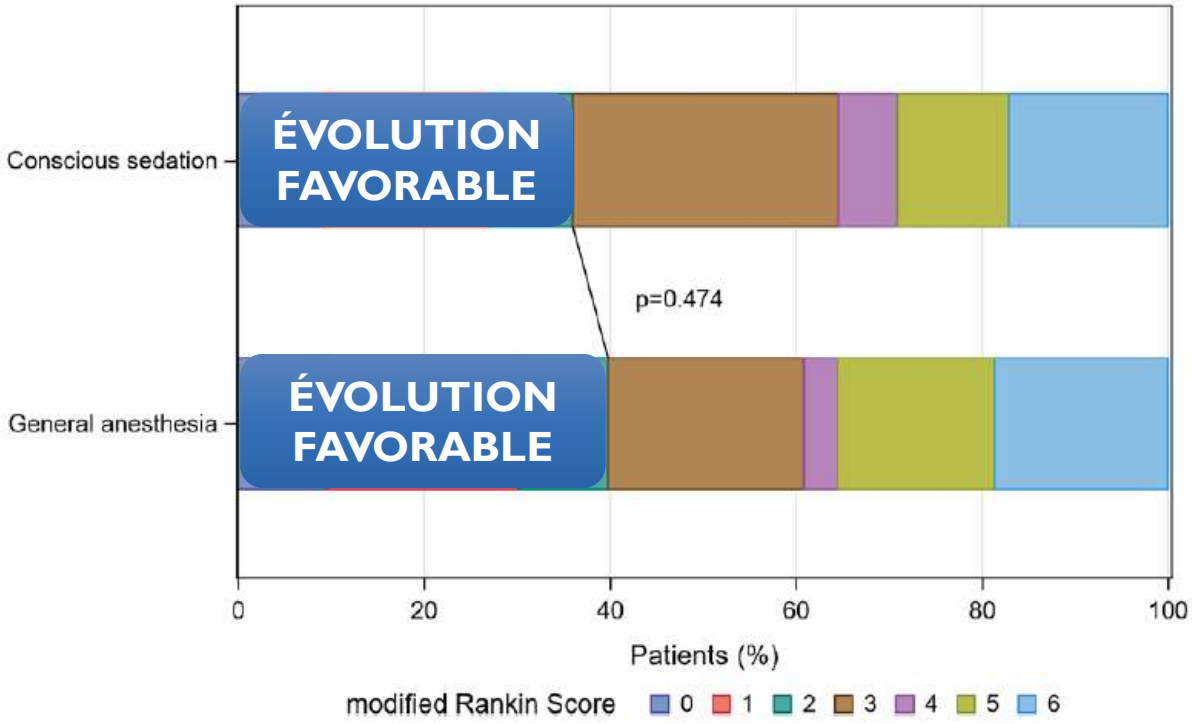
POUR LA REPERFUSION: L'AG FAIT MIEUX?

ANESTHESIOLOGY

General Anesthesia *versus* Sedation, Both with Hemodynamic Control, during Intraarterial Treatment for Stroke: The GASS Randomized Trial

Axelle Maurice, M.D., François Eugène, M.D., Thomas Ronzière, M.D., Jean-Michel Devys, M.D., Guillaume Taylor, M.D., Aurélie Subileau, M.D., Olivier Huet, M.D., Ph.D., Hakim Gherbi, M.D., Marc Laffon, M.D., Ph.D., Maxime Esvan, M.Sc., Bruno Laviolle, M.D., Ph.D., Helene Beloeil, M.D., Ph.D., for the GASS (General Anesthesia *versus* Sedation for Acute Stroke Treatment) Study Group and the French Society of Anesthesiologists (SFAR) Research Network*

ANESTHESIOLOGY 2022; 136:567–76



	Conscious Sedation	General Anesthesia	Mean/Median/Risk Difference (95% CI)	*P* Value
Time from stroke onset to groin puncture, min*	248 ± 92	269 ± 85	−20 (−39 to −01)	0.040
Time from arrival at stroke center to groin puncture, min*	60 ± 39	69 ± 44	−10 (−19 to −01)	0.037
Time from stroke onset to recanalization, min*	307 ± 87	320 ± 96	−13 (−33 to 07)	0.203
Modified Thrombolysis in Cerebral Ischemia grade 2b–3†	131 (75)	144 (85)	−10 (−18 to −2)	0.021

LA PRESSION ARTÉRIELLE

ANESTHESIOLOGY

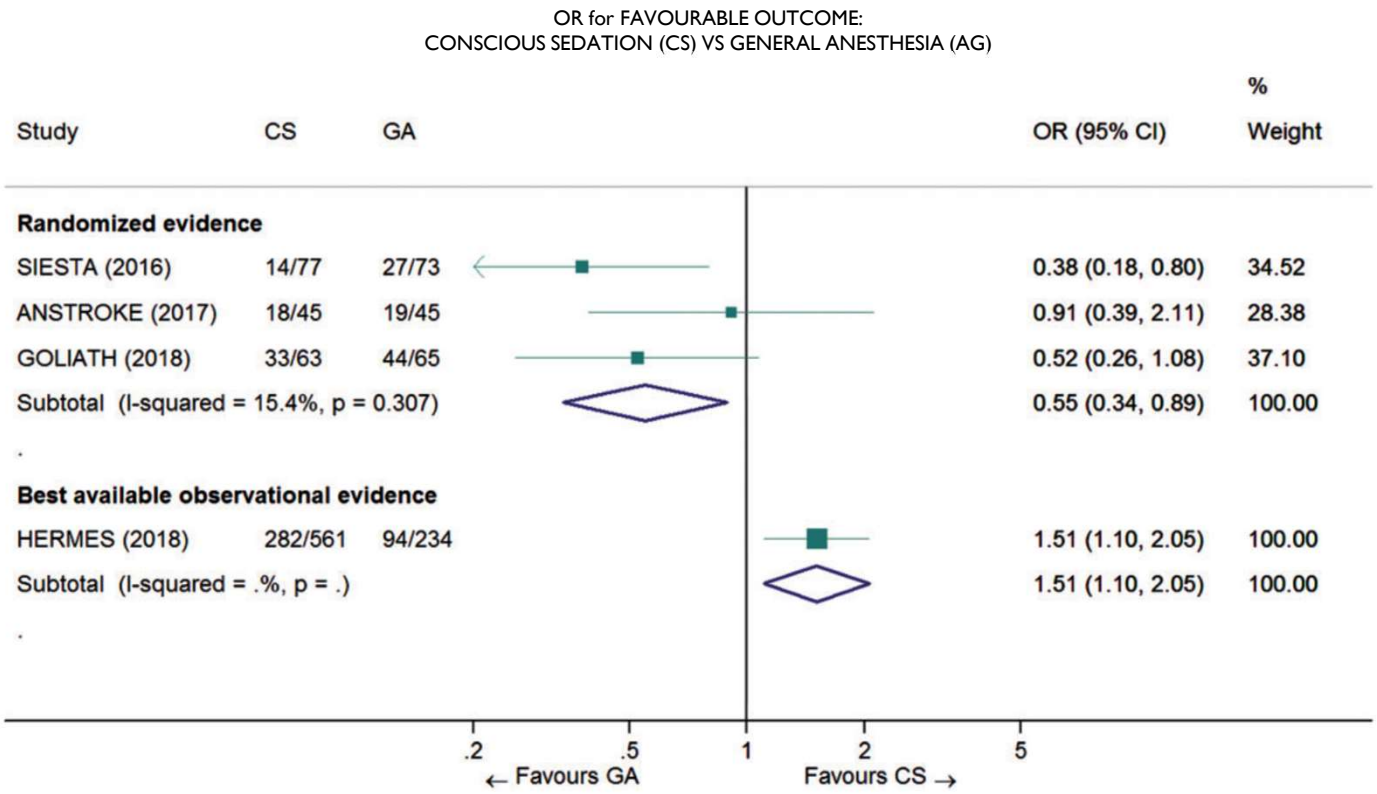
General Anesthesia *versus* Sedation, Both with Hemodynamic Control, during Intraarterial Treatment for Stroke: The GASS Randomized Trial

Axelle Maurice, M.D., François Eugène, M.D., Thomas Ronzière, M.D., Jean-Michel Devys, M.D., Guillaume Taylor, M.D., Aurélie Subileau, M.D., Olivier Huet, M.D., Ph.D., Hakim Gherbi, M.D., Marc Laffon, M.D., Ph.D., Maxime Esvan, M.Sc., Bruno Laviolle, M.D., Ph.D., Helene Beloeil, M.D., Ph.D., for the GASS (General Anesthesia *versus* Sedation for Acute Stroke Treatment) Study Group and the French Society of Anesthesiologists (SFAR) Research Network*

ANESTHESIOLOGY 2022; 136:567–76

	Conscious Sedation	General Anesthesia	Mean/Median/Risk Difference (95% CI)	*P* Value
Intraoperative hemodynamics††				
Episode(s) of hypotension	1 (1 to 2)	2 (1 to 2)	0 (–1 to 0)	0.001
≥ 1 episode of hypotension	129 (77)	163 (100)	–23 (–30 to –17)	< 0.0001
Cumulative duration of hypotension, min	36 ± 31	39 ± 25	–2 (–9 to 4)	0.079
Episode(s) of hypertension	0 (0 to 0)	0 (0 to 1)	0 (0 to 0)	0.033
≥ 1 episode of hypertension	33 (20)	49 (31)	–11 (–20 to –1)	0.030
Cumulative duration of hypertension, min	8 ± 7	11 ± 12	–1 (–5 to 4)	0.739
Intraoperative antihypertension treatment	22 (12)	19 (11)	–1 (–6 to 8)	0.749

CE QUI EST RECOMMANDÉ



Recommendation

We cannot provide recommendations to use general anaesthesia or conscious sedation in patients undergoing mechanical thrombectomy, due to a low quality of evidence and conflicting results between three small single-centre randomised clinical trials and the best available observational evidence. Therefore, we recommend the enrolment of patients in multicentre randomised controlled trials addressing this question.

Quality of evidence: **Very low** ⊕, Strength of recommendation: -

Guideline

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QUELLE ANESTHÉSIE POUR QUEL PATIENT?

Recommendation

We cannot provide recommendations to use general anaesthesia or conscious sedation in patients undergoing mechanical thrombectomy, due to a low quality of evidence and conflicting results between three small single-centre randomised clinical trials and the best available observational evidence. Therefore, we recommend the enrolment of patients in multicentre randomised controlled trials addressing this question.

Quality of evidence: **Very low** ⊕, Strength of recommendation: -

- **AG meilleure pour:**
  - **La reperfusion?**
- **Sédation consciente meilleure pour:**
  - **Le temps**
  - **Le contrôle tensionnel?**

EUROPEAN STROKE JOURNAL

Guideline

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Endorsed by Stroke Alliance for Europe (SAFE)

European Stroke Journal 0(0) 1–47 © European Stroke Organisation 2019 Article reuse guidelines: sagepub.com/journals-permissions journals.sagepub.com/home/eso SAGE

RECOS POUR PRESSION ARTÉRIELLE

EVITER CHUTE PA

In patients with acute ischaemic stroke due to large vessel occlusion undergoing treatment with mechanical thrombectomy (with or without intravenous thrombolysis) systolic blood pressure drops should be avoided.
Quality of evidence: Very low⊕
Strength of recommendation: Strong ↓↓

UTILISATION ANTIHYPERTENSEURS EN ROUTINE PENDANT 24 PREMIÈRES HEURES

In hospitalised patients with acute ischaemic stroke and blood pressure < 220/110 mmHg not treated with intravenous thrombolysis or mechanical thrombectomy, we suggest against the routine use of blood pressure lowering agents at least in first 24 hours following symptom onset, unless this is necessary for a specific comorbid condition.
Quality of evidence: Moderate⊕⊕⊕
Strength of recommendation: Weak ↓?

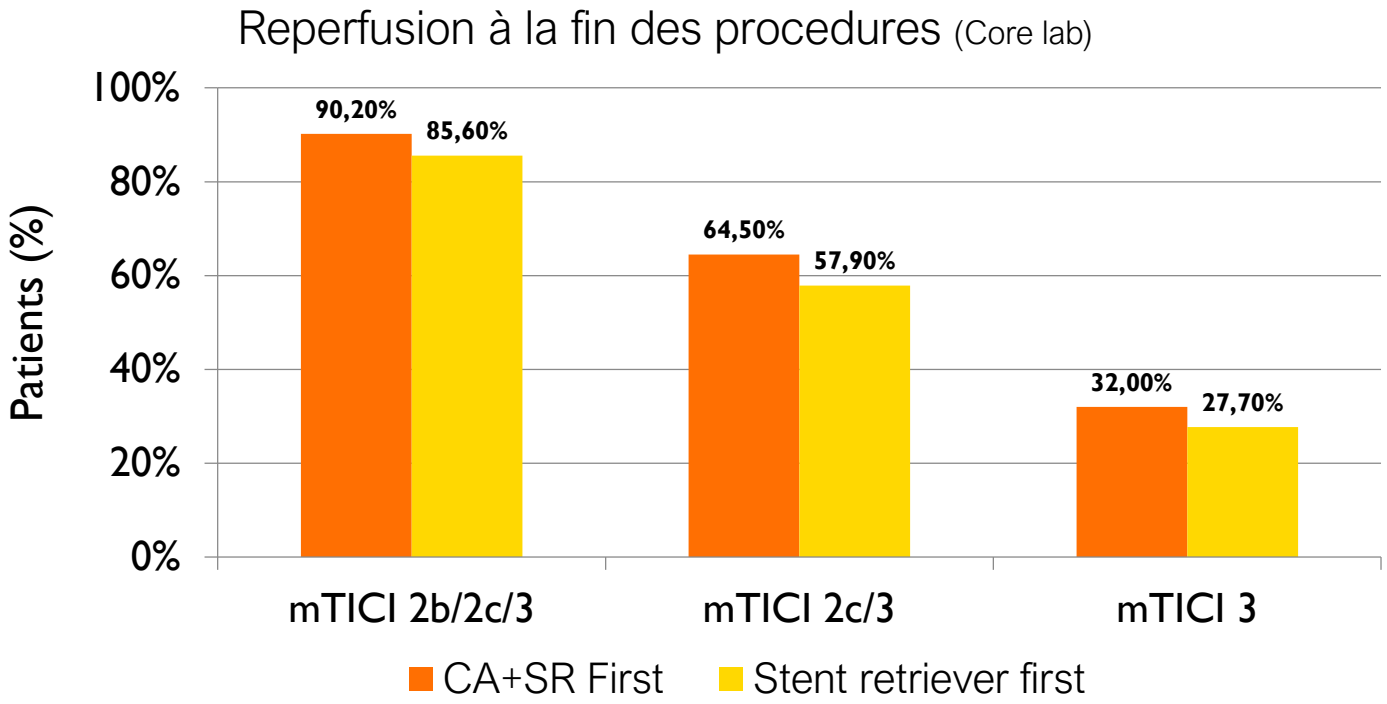
BAISSE PRESSION ARTÉRIELLE < 130 MM HG

In patients with acute ischaemic stroke undergoing treatment with intravenous thrombolysis (with or without mechanical thrombectomy) we suggest against lowering systolic blood pressure to a target of 130-140mmHg compared to <180mmHg during the first 72 hours following of symptom onset.
Quality of evidence: Moderate⊕⊕⊕
Strength of recommendation: Weak ↓?

In patients with acute ischaemic stroke due to large vessel occlusion we suggest against actively reducing systolic blood pressure <130mmHg during the first 24 hours following successful mechanical thrombectomy
Quality of evidence: Moderate⊕⊕⊕
Strength of recommendation: Weak ↓?

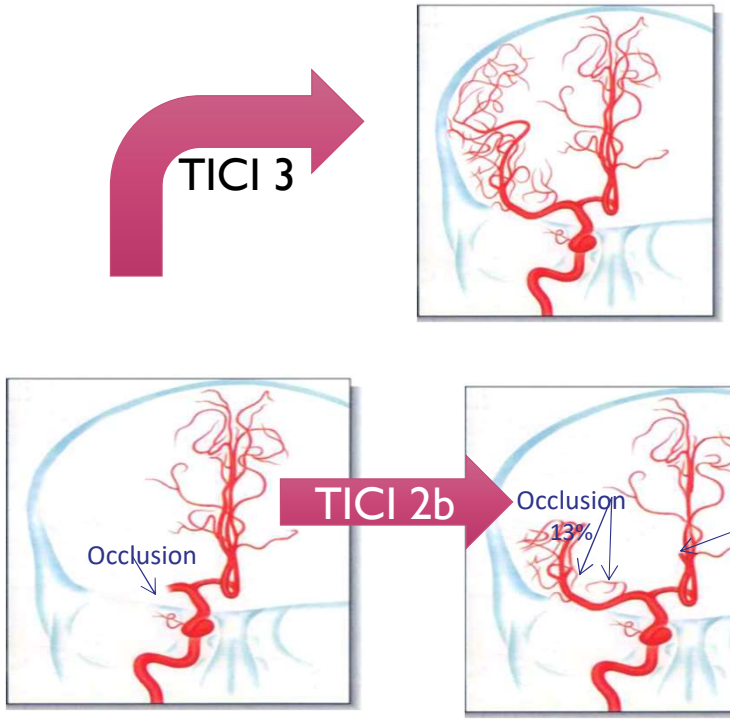
Sandset / ESO Eur Stroke J 2021

OPTIMISER LA REPERFUSION



Lapergue et al JAMA 2021

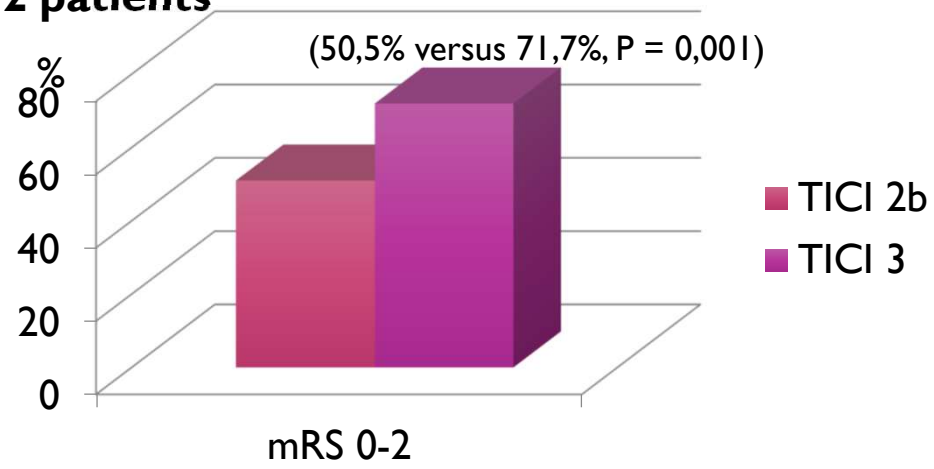
OPTIMISER LA REPERFUSION



TICI 2b vs TICI 3

Registre ETIS

222 patients

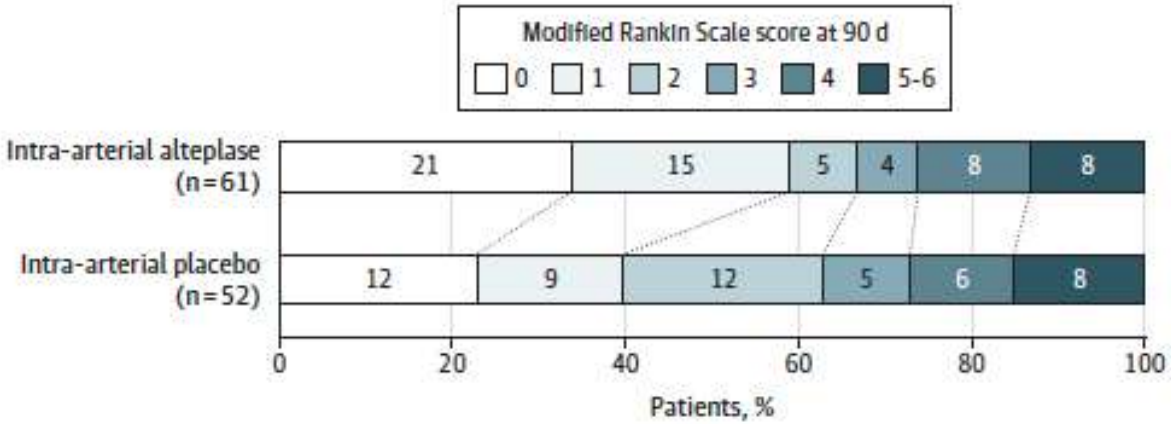


Dargazanli et al AJNR Am J Neuroradiol. 2017 Jan;38(1):90-96.

JAMA | Preliminary Communication

Effect of Intra-arterial Alteplase vs Placebo Following Successful Thrombectomy on Functional Outcomes in Patients With Large Vessel Occlusion Acute Ischemic Stroke

The CHOICE Randomized Clinical Trial



Outcomes	Alteplase (n = 61)	Placebo (n = 52)	Absolute risk difference, % (95% CI)	*P* value[a]
Primary outcome				
Score of 0 or 1 on modified Rankin Scale at 90 d, No. (%)	36 (59.0)	21 (40.4)	18.4 (0.3 to 36.4)	.047

Outcomes	No. (%) of participants	
	Alteplase (n = 61)	Placebo (n = 52)
Primary safety outcomes		
Symptomatic intracranial hemorrhage at 24 h	0	2 (3.8)
Death at 90 d	5 (8.2)	8 (15.4)

JAMA. doi:10.1001/jama.2022.1645
Published online February 10, 2022.

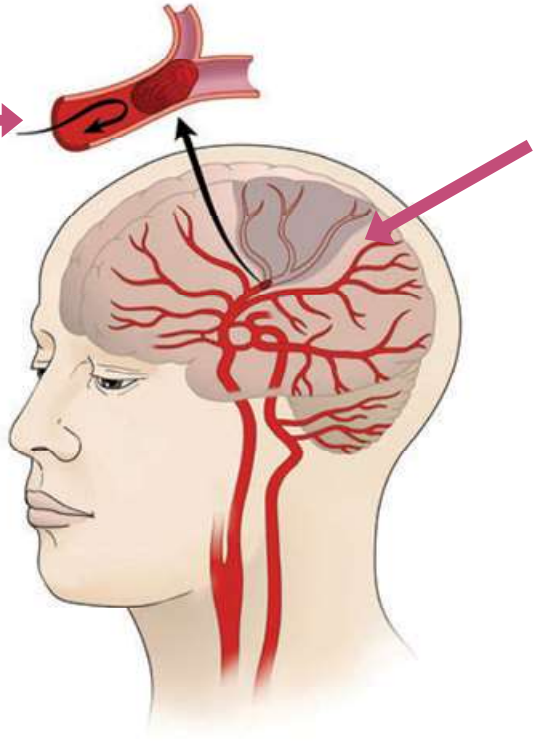
GLENZOCIMAB: ANTIPLAQUETTAIRE ANTI GP 6

Glenzocimab : anticorps monoclonal

- **Activité antithrombotique**
- **Pas d'effet sur l'hémostase**

Cibles de Glenzocimab

1- Neo-formation de thrombus plaquettaire au site de fibrinolyse [1,2]



2- Thrombo-inflammation de la microcirculation et transformation hémorragique [3,4,5,6]

EFFET "ADD-ON" sur la recanalisation

EFFET "STAND-ALONE" sur la microcirculation

1. Loyau et al. *Arterioscler Thomb Vasc Biol* 38: 2626 (2018).
2. Ahmed M et al, *Arterioscler Thomb Vasc Biol*, 40:2127 (2020).
3. Desilles, J.-P. *et al. J. Am. Heart Assoc.* 7,e007804 (2018).
4. Bieber M. *et al. Exp. Neurol.* 344, 113804 (2021)
5. Ng F. C. *et al. Neurology* 98, (2022).
6. Desilles J.-P. *et al. Stroke* 46, (2015).

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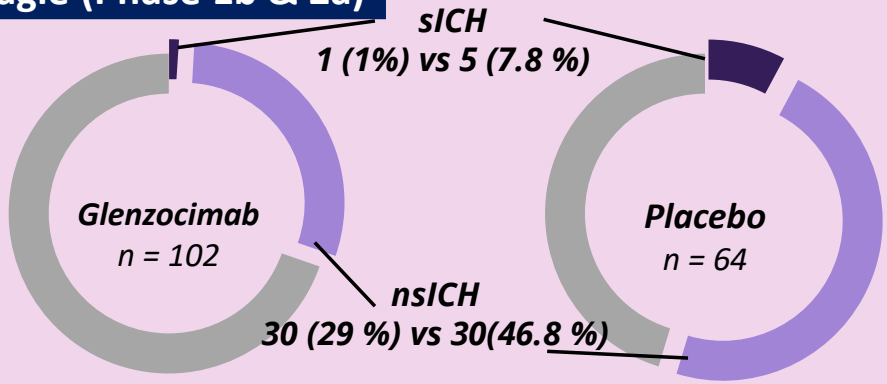
GLENZOCIMAB À LA PHASE AIGUE DE L'ISCHÉMIE CÉRÉBRALE

Hémorragie (Phase 1b & 2a)

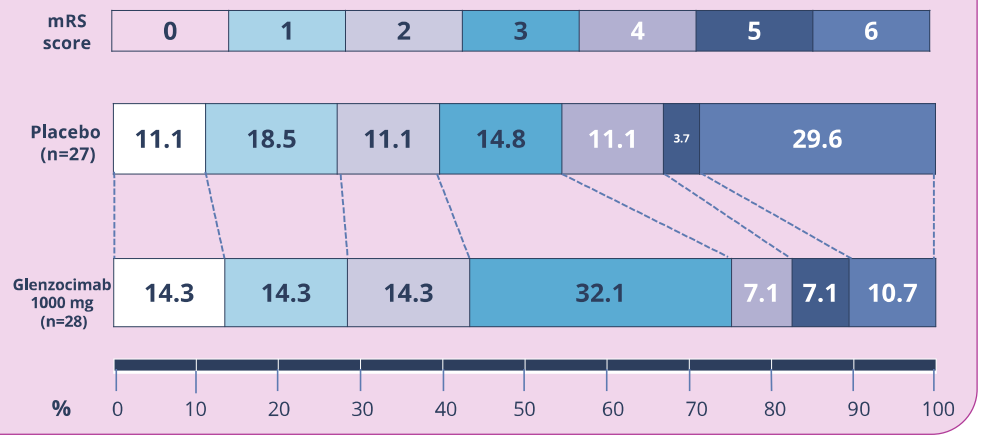


Recanalisation *N=27/27*

mTICI score	Glenzocimab n(%)	Placebo n(%)
Succès	26 (96)	23 (85)
Échec	1 (4)	4 (15)

Mortalité (Phase 2b)

mRS shift à 90 jours*



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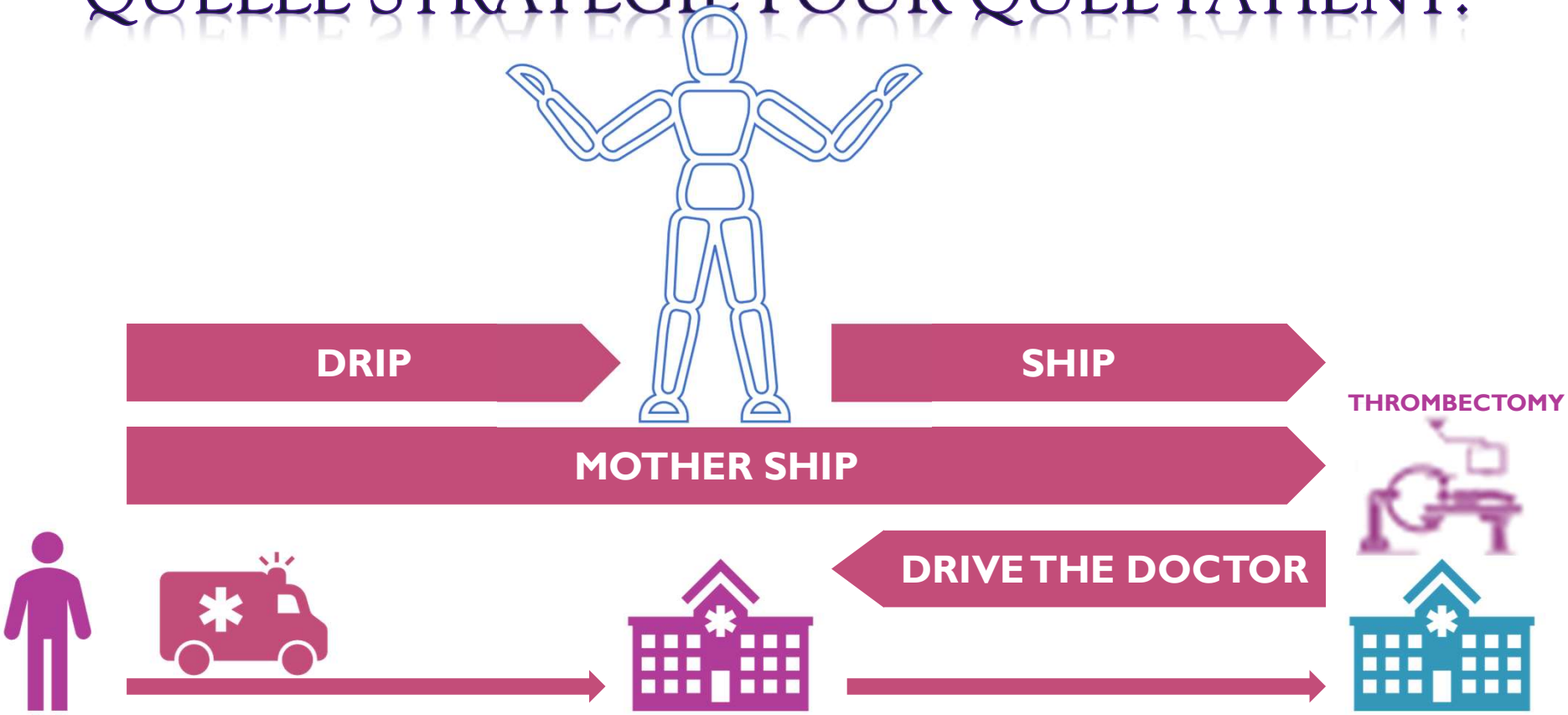
* Patients thrombectomisés

QUELLE STRATÉGIE POUR QUEL PATIENT?



ARRÊTÉE POUR FUTILITÉ

JAMA

QUESTION In patients experiencing suspected large-vessel occlusion (LVO) stroke in a nonurban area, is there a difference in neurological outcomes between those who are transported to the closest local stroke center vs directly to a thrombectomy-capable center?

CONCLUSION In nonurban areas in Catalonia, Spain, there was no significant difference in 90-day neurological outcomes between transportation to a local stroke center vs a thrombectomy-capable referral center in patients with suspected LVO stroke.

POPULATION

521 Men
428 Women

Patients with a suspected acute LVO stroke who were attended by emergency medical personnel

Median age: 75 years

LOCATIONS

28
Medical centers in Catalonia, Spain

INTERVENTION

1401 Patients randomized
949 Patients analyzed

482
Thrombectomy-capable center
Initial transport to thrombectomy-capable medical center

467
Local stroke center
Initial transport to closest local stroke center with no thrombectomy capabilities

PRIMARY OUTCOME

Disability at 90 days as assessed by the modified Rankin Scale (mRS; scores, 0 [no symptoms] to 6 [death]) among patients with a final diagnosis of ischemic stroke

FINDINGS

Disability at 90 days

Thrombectomy-capable center
Median mRS score, 3 (IQR, 2-5)

Local stroke center
Median mRS score, 3 (IQR, 2-5)

Between-group difference was not significant:
Adjusted common odds ratio, 1.03
(95% CI, 0.82 to 1.29)

MOINS DE THROMBOLYSE IV en cas de MOTHERSHIP

PLUS DE THROMBECTOMIE en cas de MOTHERSHIP

Pérez de la Ossa N, Abilleira S, Jovin TG, et al; RACECAT Trial Investigators. Effect of direct transportation to thrombectomy-capable center vs local stroke center on neurological outcomes in patients with suspected large-vessel occlusion stroke in nonurban areas. *JAMA*. Published online May 5, 2022. doi: 10.1001/jama.2022.4404

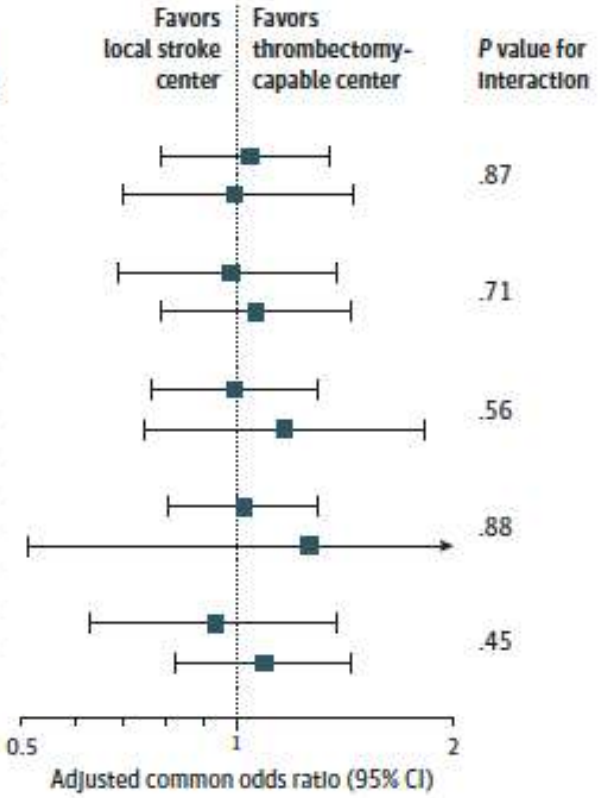
• ÉTUDE RACECAT

Characteristics	Target population[b]		As-randomized population[c]	
	Thrombectomy-capable center (n = 482)	Local stroke center (n = 467)	Thrombectomy-capable center (n = 679)	Local stroke center (n = 690)
Time from stroke onset to first hospital arrival, median (IQR), min	142 (100-231)	88 (61-145)	140 (99-216)	91 (64-155)
Time from stroke onset to first hospital arrival <4 h, No. (%)	370 (76.8)	403 (86.3)	535 (78.8)	592 (85.8)
Transferred to thrombectomy-capable center, No. (%)		302 (64.6)		
Time from arrival to discharge at referral hospital (calculated in patients transferred), median (IQR), min		78 (63-97)		
Time from arrival at first hospital to intravenous alteplase administration, median (IQR), min	30 (22-40)	33 (25-48)		
Time from thrombectomy-capable center arrival to groin puncture, median (IQR), min	71 (49-97)	43 (32-59)		

Pérez de la Ossa N, Abilleira S, Jovin TG, et al; RACECAT Trial Investigators. Effect of direct transportation to thrombectomy-capable center vs local stroke center on neurological outcomes in patients with suspected large-vessel occlusion stroke in nonurban areas. *JAMA*. Published online May 5, 2022. doi: 10.1001/jama.2022.4404

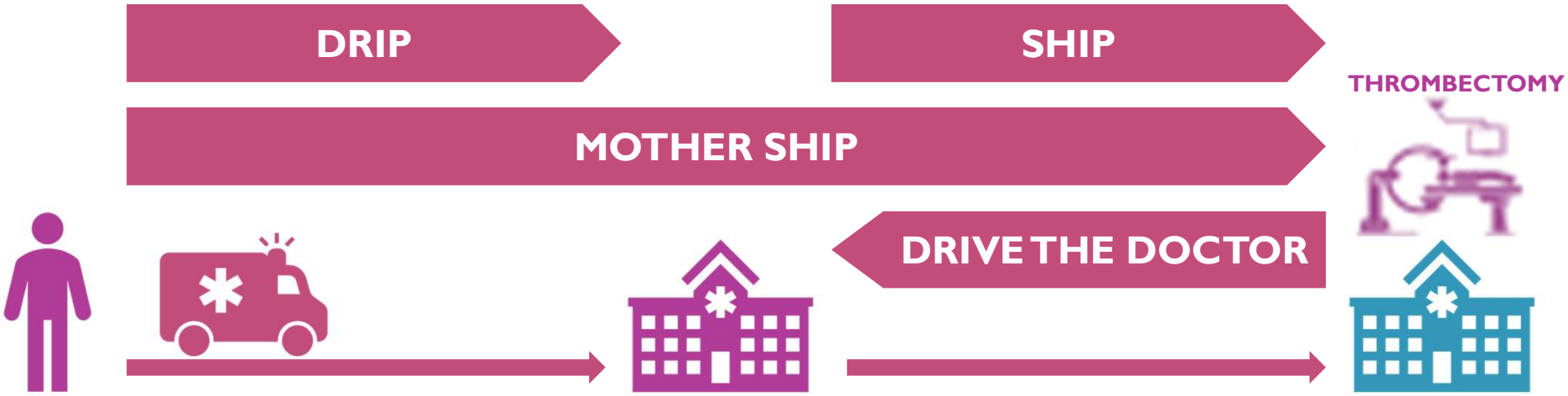
• ÉTUDE RACECAT

Subgroup	No./total No. (%) with 1-point reduction in mRS score at 90 d: Thrombectomy-capable center	Local stroke center	Adjusted common odds ratio (95% CI)	P value for interaction
Age, y				
<80	415/866 (48)	451/866 (52)	1.04 (0.78-1.34)	.87
≥80	264/503 (52)	239/503 (48)	0.99 (0.69-1.45)	
Sex				
Female	293/601 (49)	308/601 (51)	0.98 (0.68-1.38)	.71
Male	386/768 (51)	382/768 (49)	1.06 (0.78-1.44)	
tPA treatment eligibility[a]				
Yes	457/931 (49)	477/931 (51)	0.99 (0.76-1.29)	.56
No	222/435 (51)	213/435 (49)	1.16 (0.74-1.82)	
Confirmed mRS score 0-2 on hospital arrival[b]				
Yes	618/1254 (49)	636/1254 (51)	1.02 (0.80-1.29)	.88
No	61/114 (53)	53/114 (47)	1.26 (0.51-3.11)	
RACE Scale score during EMS evaluation[c]				
5-7	464/927 (50)	463/927 (50)	0.93 (0.62-1.38)	.45
8-9	215/442 (49)	227/442 (51)	1.08 (0.82-1.44)	

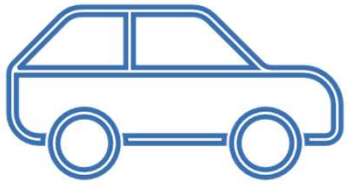


Pérez de la Ossa N, Abilleira S, Jovin TG, et al; RACECAT Trial Investigators. Effect of direct transportation to thrombectomy-capable center vs local stroke center on neurological outcomes in patients with suspected large-vessel occlusion stroke in nonurban areas. *JAMA*. Published online May 5, 2022. doi: 10.1001/jama.2022.4404

DRIVE THE DOCTOR



DRIVE THE DOCTOR

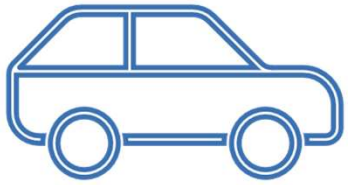


Transferring neurointerventionalists saves time compared with interhospital transfer of stroke patients for endovascular thrombectomy: a collaborative pooled analysis of 1001 patients (EVEREST)

Study, No of patients	Stroke networks	Triage concepts	Years of recruiting	Year published
Seker, n=126[15]	Heidelberg, Germany	DS, EXT	2012–16	2018
Brekenfeld, n=74[13]	Hamburg, Germany	DS, EXT	2016	2018
Osanai, n=133*[14]	Hokkaido, Japan	EXT	2015–19	2019
NEUROSQUAD, n=440[17]	Heidelberg, Germany and Hamburg, Germany	DS, EXT, MS	2018	2020
Morey, n=228[19]	New York City, USA	DS, EXT, MS	2016–18	2020

Seker F, *et al*. *J NeuroIntervent Surg* 2022;**0**:1–5. doi:10.1136/neurintsurg-2021-018049

DRIVE THE DOCTOR

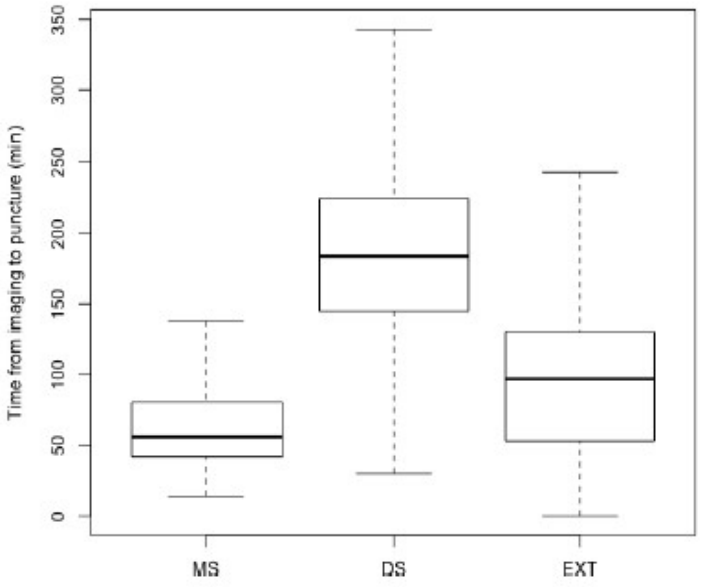


Transferring neurointerventionalists saves time compared with interhospital transfer of stroke patients for endovascular thrombectomy: a collaborative pooled analysis of 1001 patients (EVEREST)

Table 3 Comparison of time metrics in the three triage concepts

	MS (n=162, 16.2%)	DS (n=458, 45.8%)	EXT (n=381, 38.1%)	P value*	P value† MS vs DS	P value† MS vs EXT	P value† DS vs EXT
Onset to imaging (min)	110 (69–313)	113 (65–265)	93 (57–171)	<0.001	0.742	0.002	<0.001
Onset to EVT (min)	180 (130–422)	320 (243–480)	195 (145–274)	<0.001	<0.001	0.27	<0.001
Imaging to EVT (min)	56 (42–80)	184 (145–225)	97 (53–130)	<0.001	<0.001	<0.001	<0.001

Time metrics given as median (IQR).
*Kruskal–Wallis test between MS, DS, and EXT.
†Post hoc Conover test with Benjamini–Hochberg correction.
DS, drip and ship; EVT, endovascular thrombectomy; EXT, thrombectomy at external hospital; MS, mothership.



	MS (n=162)	DS (n=458)	EXT (n=381)	P value
Age (years) (mean (SD))	72.1 (12.4)	71.9 (13.8)	74.1 (12.7)	0.074
Women (n (%))	82 (50.6)	229 (50.0)	201 (52.8)	0.721
Baseline NIHSS (median (IQR))	15 (9–21)	16 (12–20)	16 (12–20)	0.361
Occlusion site (n (%))				
ICA	34 (21.0)	114 (24.9)	109 (28.6)	0.483
MCA	113 (69.8)	301 (65.7)	242 (63.5)	
BA	14 (7.4)	33 (7.2)	23 (6.0)	
Other	3 (1.9)	10 (2.1)	7 (1.8)	
Intravenous thrombolysis (n (%))	55 (34.0)	267 (58.3)	225 (59.1)	<0.001

Seker F, *et al*. *J NeuroIntervent Surg* 2022;**0**:1–5. doi:10.1136/neurintsurg-2021-018049

• MOBILE STROKE UNIT

The NEW ENGLAND JOURNAL of MEDICINE

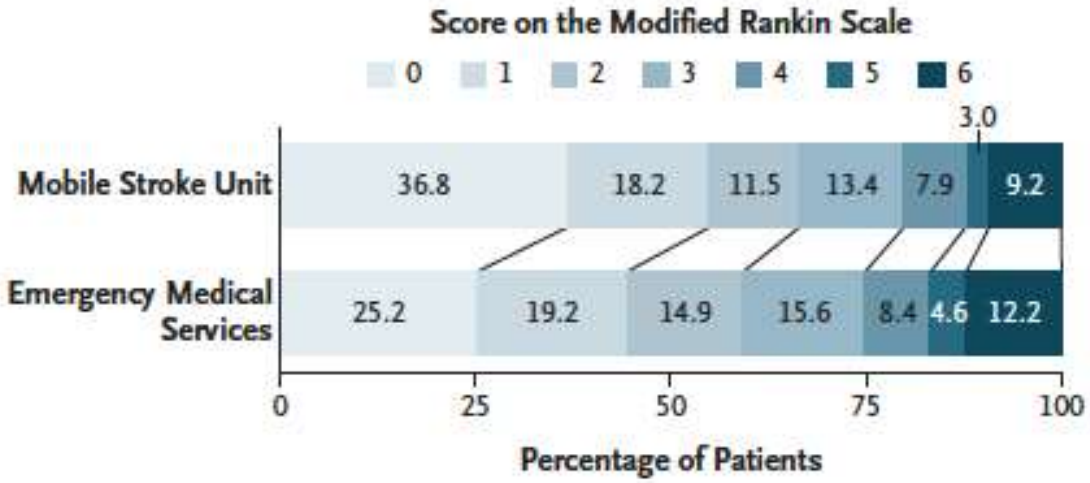
ESTABLISHED IN 1812 SEPTEMBER 9, 2021 VOL. 385 NO. 11

Prospective, Multicenter, Controlled Trial of Mobile Stroke Units

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 SEPTEMBER 9, 2021 VOL. 385 NO. 11

Prospective, Multicenter, Controlled Trial of Mobile Stroke Units

- 1515 patients, <4h30
- Critère jugement I[al]: mRS pondéré pts éligible au tPA



- mRS 0-1 chez patients éligibles au tPA, 55,0% groupe MSU vs 44,4% bras contrôle

Characteristic	Patients Eligible for t-PA†		All Enrolled Patients	
	Mobile Stroke Unit (N=617)	Emergency Medical Services (N=430)	Mobile Stroke Unit (N=886)	Emergency Medical Services (N=629)
Median age (IQR) — yr	67 (57–79)	65 (55–78)	67 (55–78)	65 (55–77)
NIHSS score‡				
Median (IQR)	9 (5–16)	9 (6–16)	9 (5–17)	10 (6–16)
Distribution — no. (%)				
0–5	159 (25.8)	102 (23.7)	231 (26.1)	151 (24.0)
6–12	252 (40.8)	174 (40.5)	330 (37.2)	240 (38.2)
≥13	206 (33.4)	154 (35.8)	325 (36.7)	238 (37.8)

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Interval	Mobile Stroke Unit	Emergency Medical Services
	minutes	
Median interval between the time that the patient was last known to be well and t-PA treatment (IQR)	72 (55–105)	108 (84–147)
Median time from 911 alert to t-PA treatment (IQR)	46 (39–55)	78 (66–93)
Median time from ED door to t-PA bolus (IQR)	—	40 (30–51)
Median interval between the time that the patient was last known to be well and the alerting of emergency medical services (IQR)	23 (8–52)	22 (11–60)
Median time from 911 alert to arrival of emergency medical services (IQR)	9 (6–13)	9 (6–13)
Median time from arrival of emergency medical services to ED arrival (IQR)	55 (47–62)	27 (21–33)
Median interval between the time that the patient was last known to be well and endovascular thrombectomy (IQR)	166 (131–202)	163 (134–209)
Median time from 911 alert to endovascular thrombectomy (IQR)	141 (116–171)	132 (114–160)
Median time from ED door to endovascular thrombectomy (IQR)	76 (53–105)	94 (72–124)

EN RÉSUMÉ


THROMBECTOMIE
RECOMMANDÉ:
THROMBOLYSE IV+THROMBECTOMIE
SUGGÉRÉ (opinion d'expert):
occlusion artère basilaire, gros volumes
NON RECOMMANDÉ:
Modalité d' anesthésie, Stratégie d'adressage