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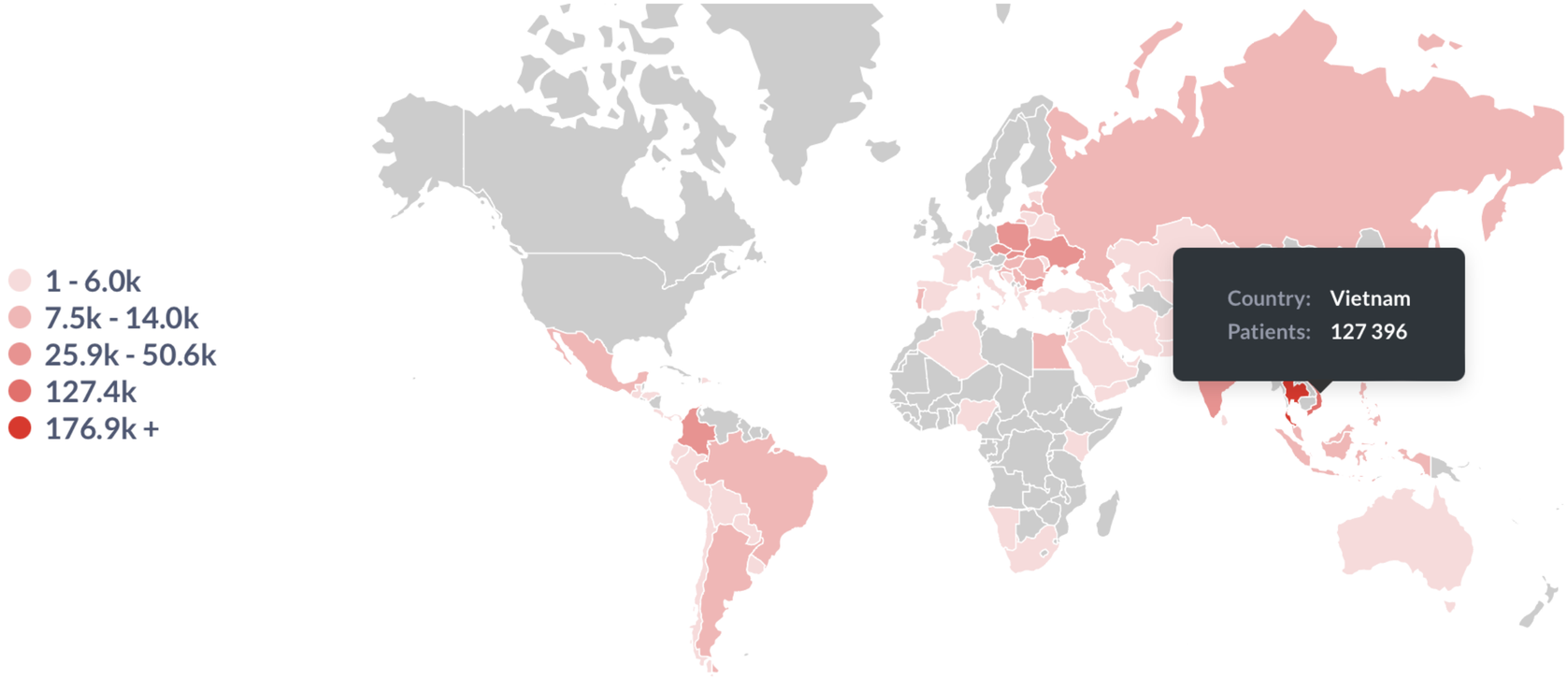
VÌ MỘT TRÁI TIM KHỎE

CẬP NHẬT ĐIỀU TRỊ ĐỘT QUỴ NHỒI MÁU NÃO CẤP

BSCKII. Nguyễn Duy Chinh
Khoa CBMM

VÌ MỘT TRÁI TIM KHỎE

Number of stroke patients enrolled in RES-Q per country



Total hospitals and patients per cou

Country	Hospitals
Thailand	114
Vietnam	66
Czechia	53
Poland	88
Slovakia	64
Ukraine	118
Bulgaria	29
Colombia	109
India	323
South Korea	46
Latvia	9
Romania	43
Indonesia	94
Portugal	40

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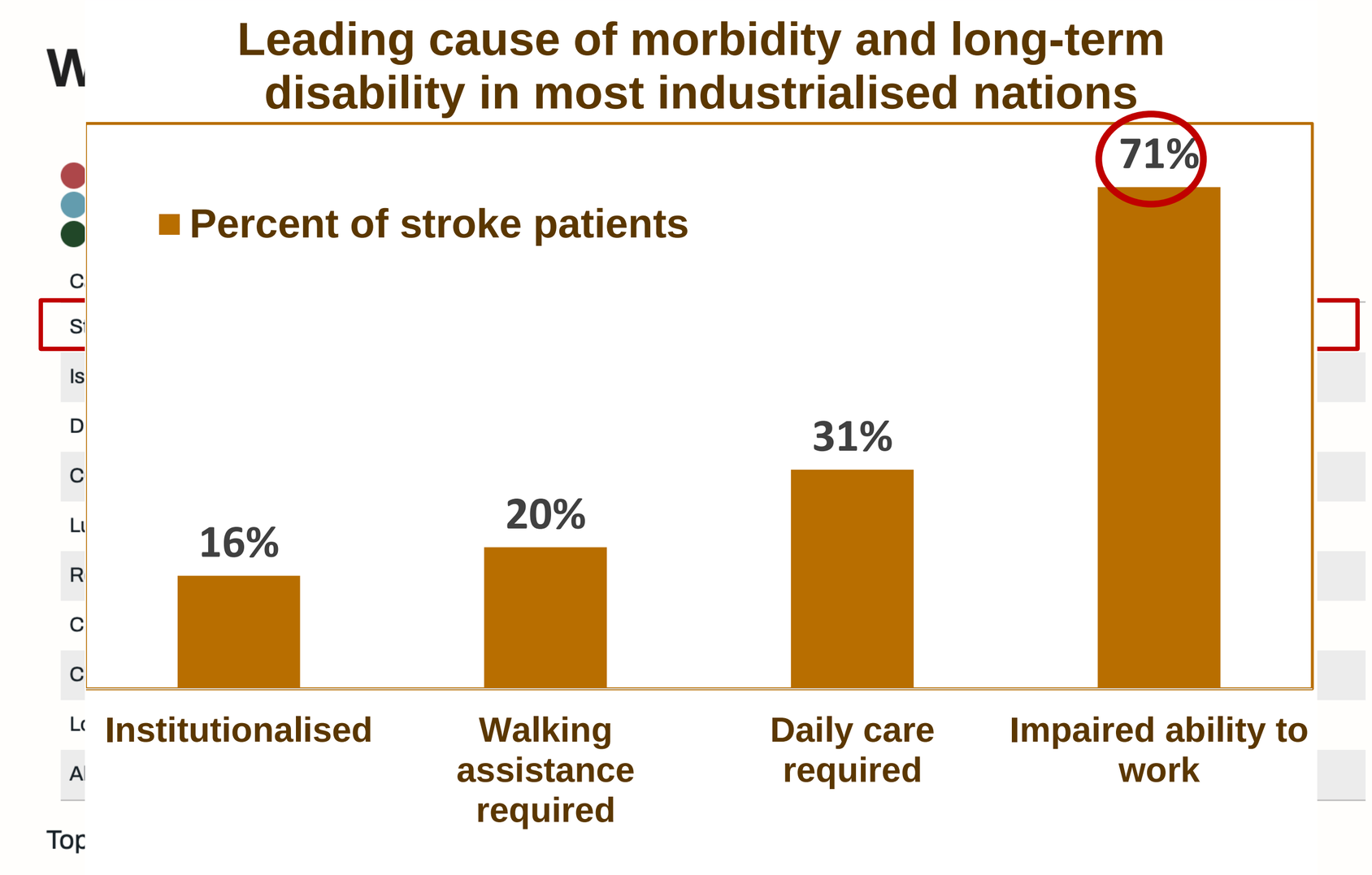
ĐỘT QUỴ LÀ NGUYÊN NHÂN GÂY TỬ VONG HÀNG ĐẦU VIỆT NAM



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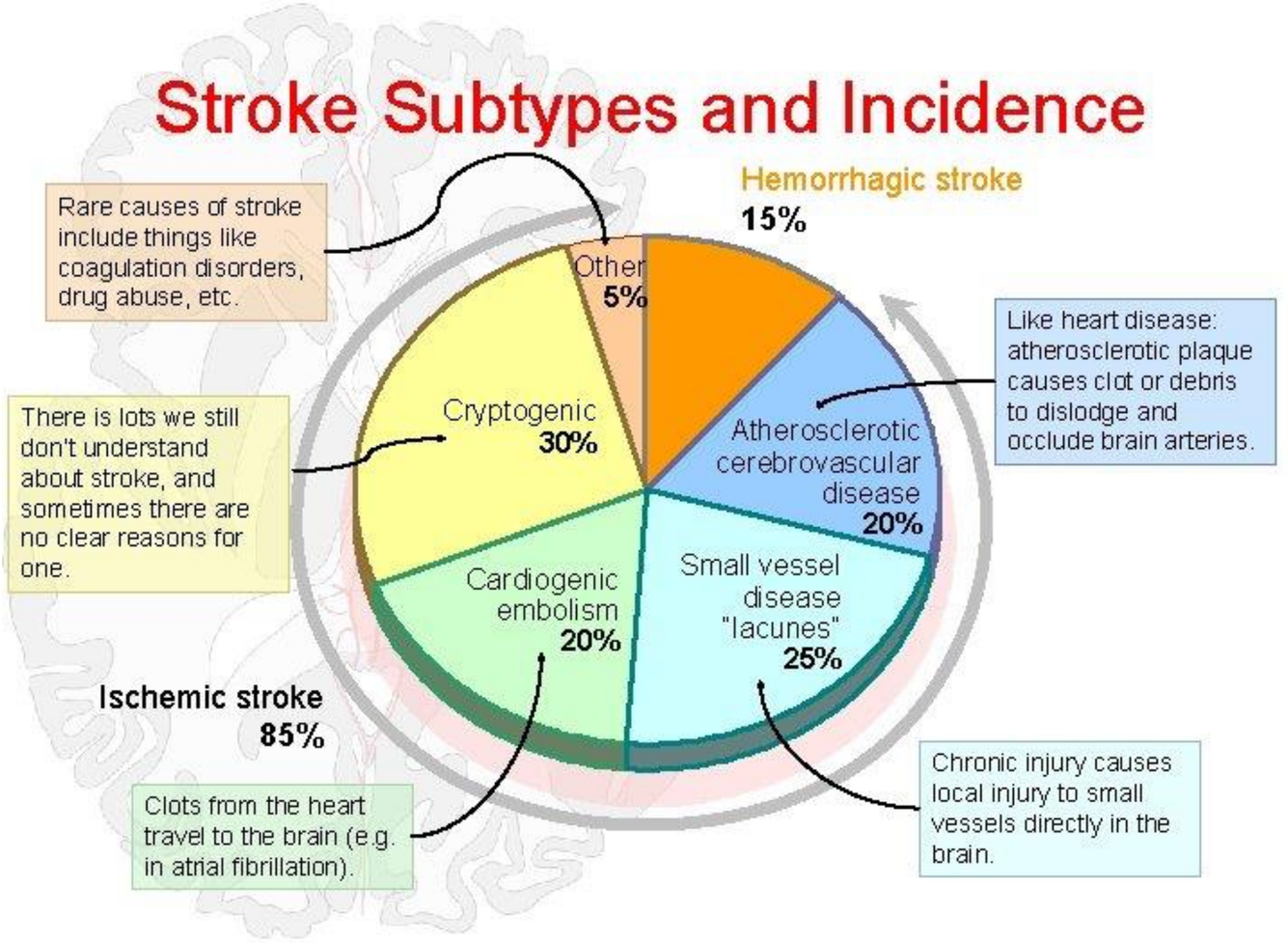
PHÂN LOẠI ĐỘT QUỴ



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NỘI DUNG TRÌNH BÀY

1. Điều trị tái thông trong cửa sổ tiêu chuẩn
2. Tiêu sợi huyết đột quỵ không rõ thời gian khởi phát
3. Can thiệp nội mạch cửa sổ mở rộng 6-24 giờ
4. Can thiệp nội mạch nhồi máu não ASPECT thấp
5. Kết luận

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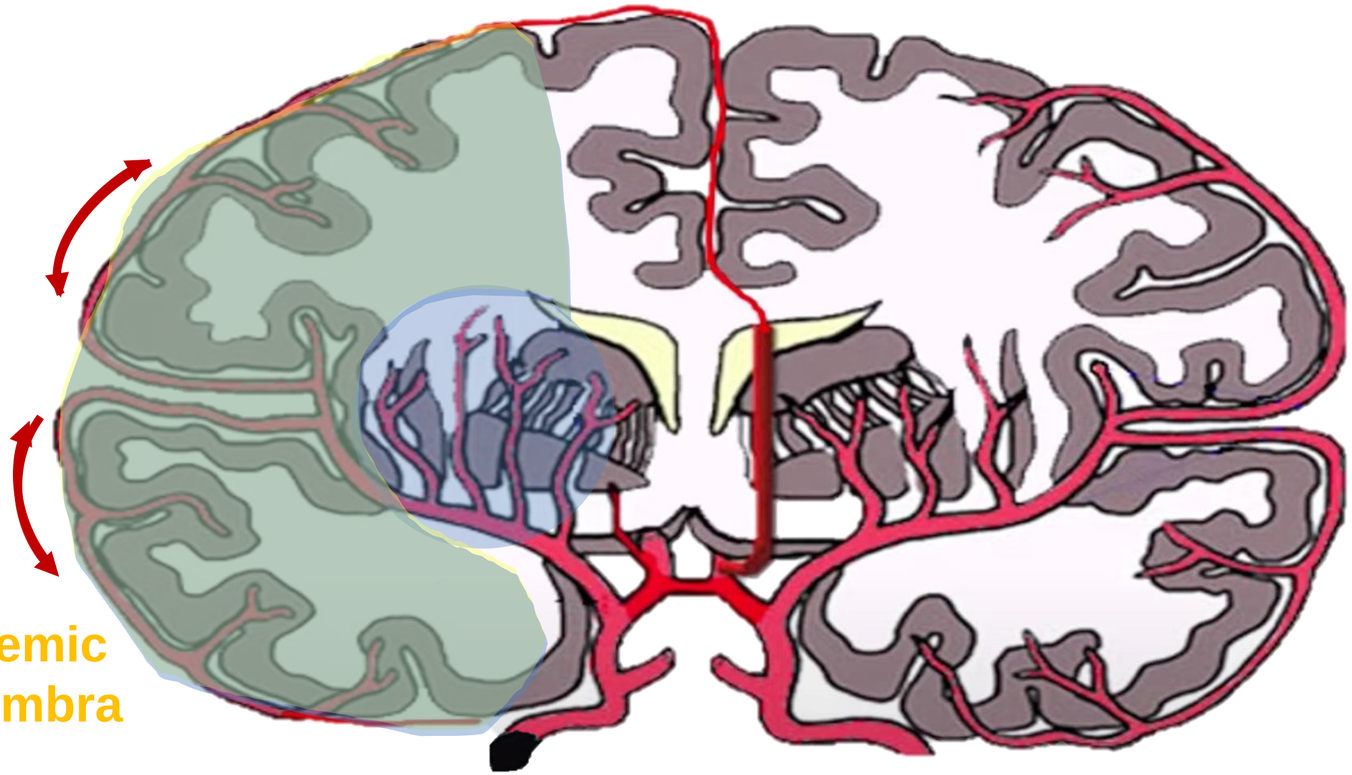
85% là đột quỵ thiếu máu

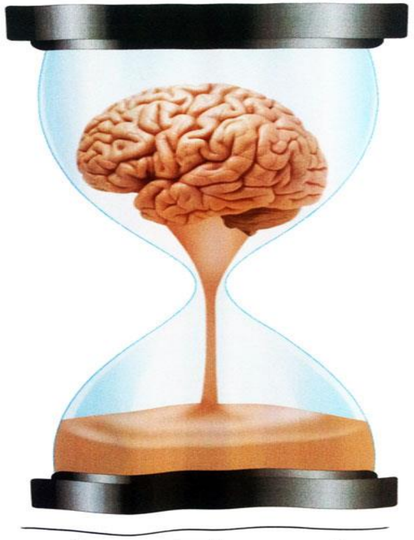
Anterior Cerebral Artery collaterals

Infarct core

Ischemic Penumbra

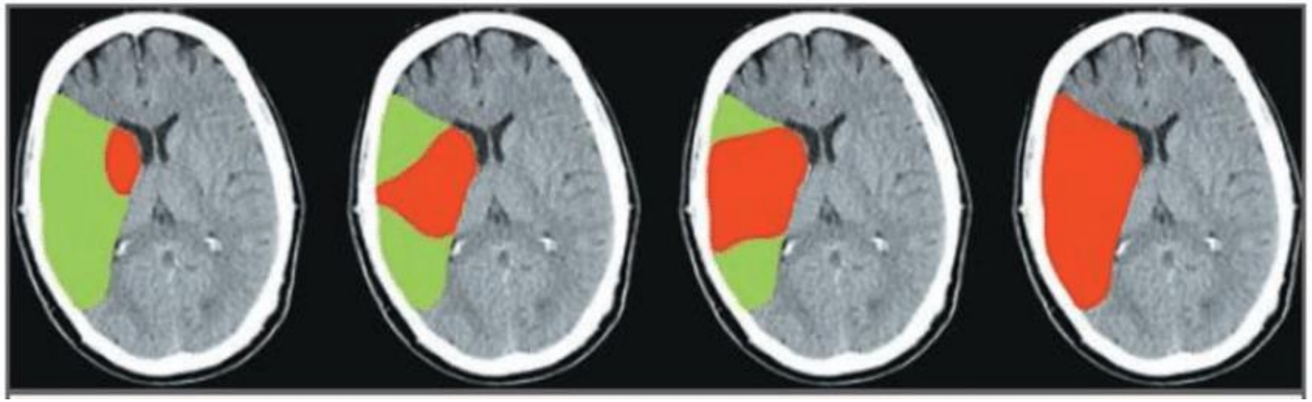


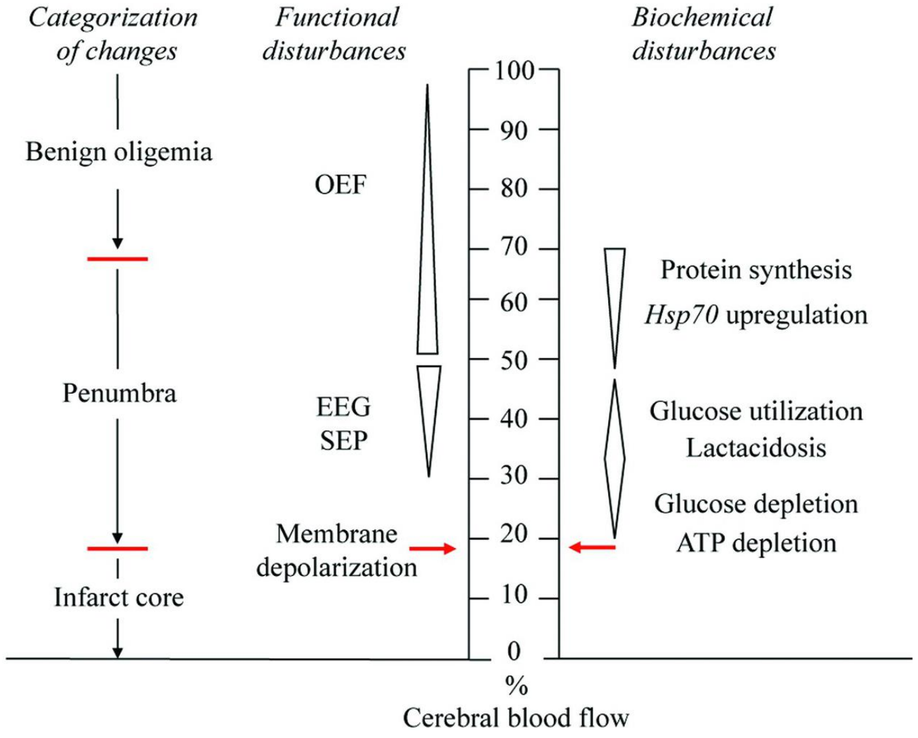
Posterior Cerebral Artery collaterals

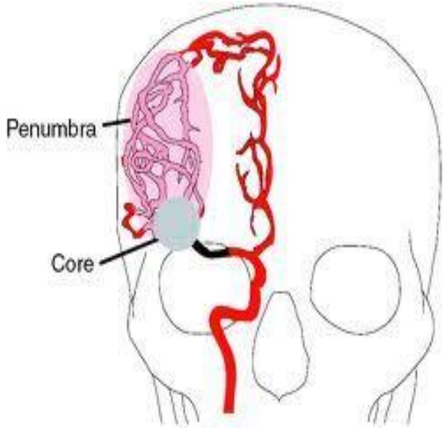


Stroke : Time lost is brain lost

PENUMBRA







NIHSS = **CORE** + **PENUMBRA**

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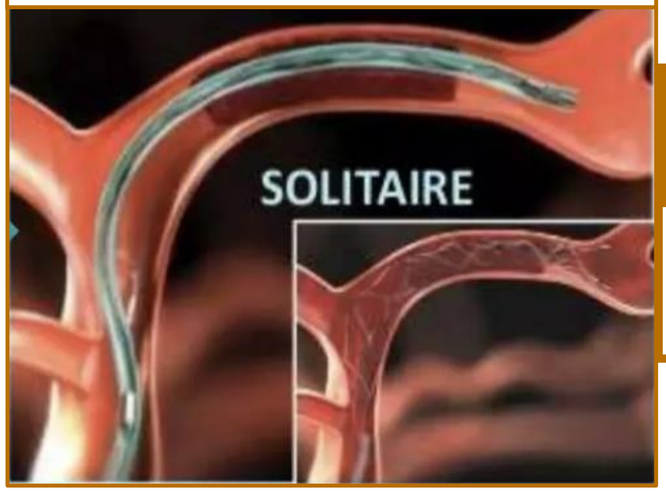
80-85% là đột quỵ thiếu máu

Tái thông mạch là điều trị vàng

Cửa sổ 4,5 giờ

rtPA (Alteplase – Actilyse) đường TM



Lấy huyết khối cơ học bằng dụng cụ

Cửa sổ 6 giờ

Và sau 6 giờ?

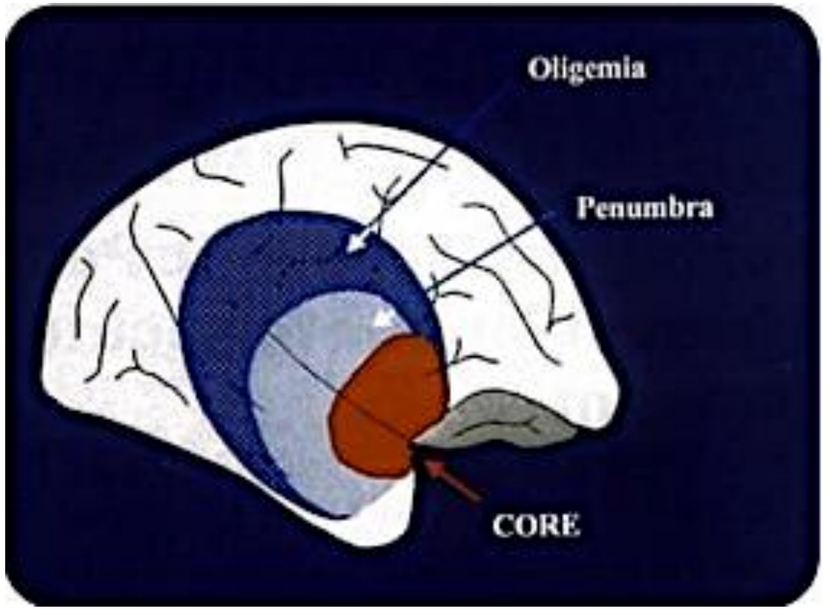
Cửa sổ mở rộng 6-24h

Time clock

Restricted to Time

VS

Tissue Clock



Restricted to the presence of penumbral tissue

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PHƯƠNG PHÁP ĐIỀU TRỊ TÁI THÔNG

TIÊU SỢI HUYẾT TM

- NINDS
- ECASS III
- WAKEUP Unknown Onset

0 — ? — 3 — 4.5 — 6 — 9 — 16 — 24 (Giờ)

CAN THIỆP MẠCH NÃO

- MR CLEAN
- ESCAPE
- REVASCAST
- SWIFT PRIME
- EXTEND-IA
- DEFUSE III
- DAWN

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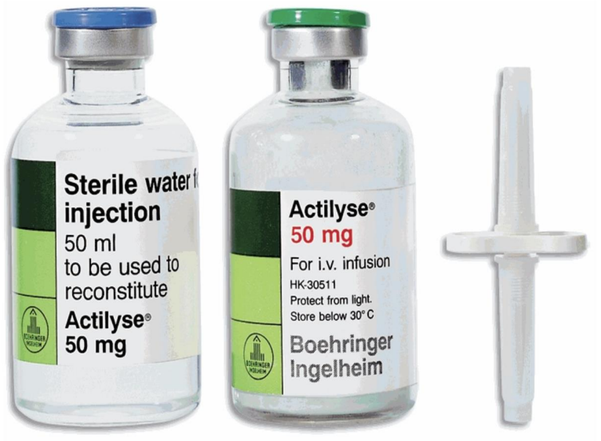
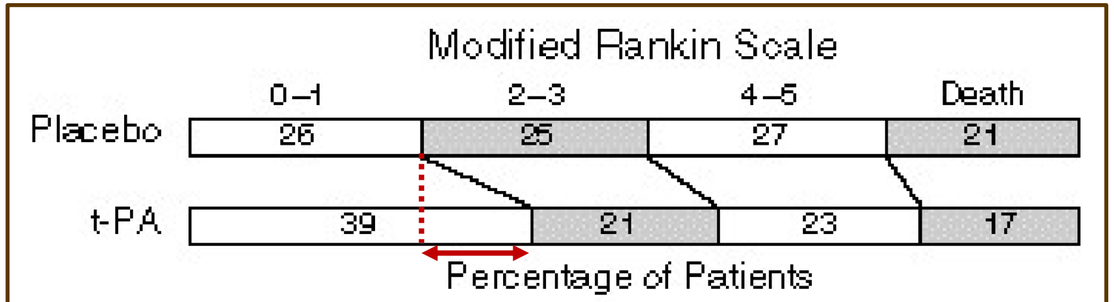
TIÊU SỢI HUYẾT TĨNH MẠCH: 0-4.5 giờ

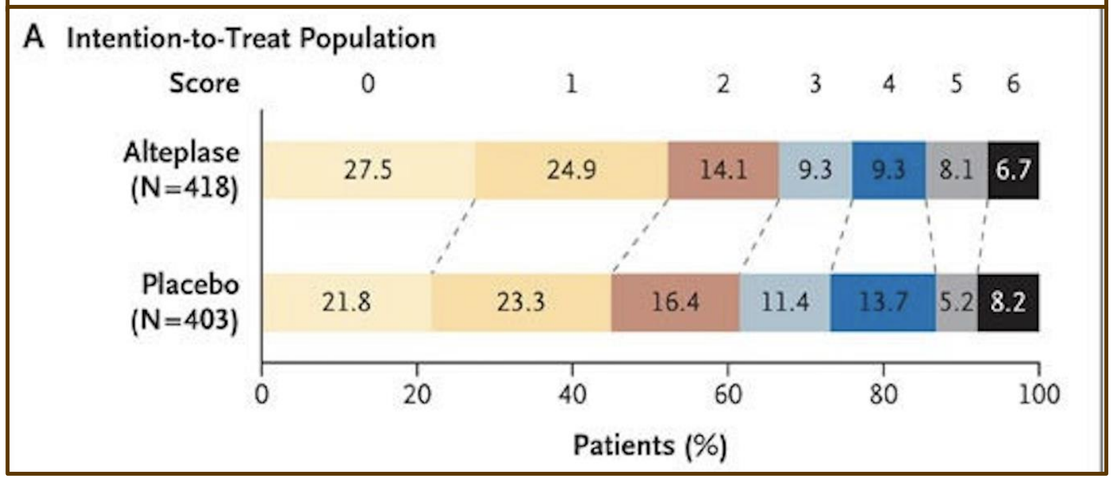


NINDS (1995)
0-3H



NNT: 8

ECASS 3 (2008)
3-4,5H



NNT: 14

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TIÊU SỢI HUYẾT TĨNH MẠCH: 0-4.5 giờ

AHA/ ASA 2019

3.5.2. Time Windows	COR	LOE
1. IV alteplase (0.9 mg/kg, maximum dose 90 mg over 60 minutes with initial 10% of dose given as bolus over 1 minute) is recommended for selected patients who can be treated within 3 hours of ischemic stroke symptom onset or patient last known well or at baseline state. Physicians should review the criteria outlined in Table 8 to determine patient eligibility.	I	A
2. IV alteplase (0.9 mg/kg, maximum dose 90 mg over 60 minutes with initial 10% of dose given as bolus over 1 minute) is also recommended for selected patients who can be treated within 3 and 4.5 hours of ischemic stroke symptom onset or patient last known well or at baseline state. Physicians should review the criteria outlined in Table 8 to determine patient eligibility.	I	B-R

ESO 2021

Recommendation

For patients with acute ischaemic stroke of <4.5 h duration, we recommend intravenous thrombolysis with alteplase.

Quality of evidence: **High** ⊕⊕⊕⊕

Strength of recommendation: **Strong** ↑↑

TIÊU SỢI HUYẾT:
Đột quỵ không rõ thời gian khởi phát

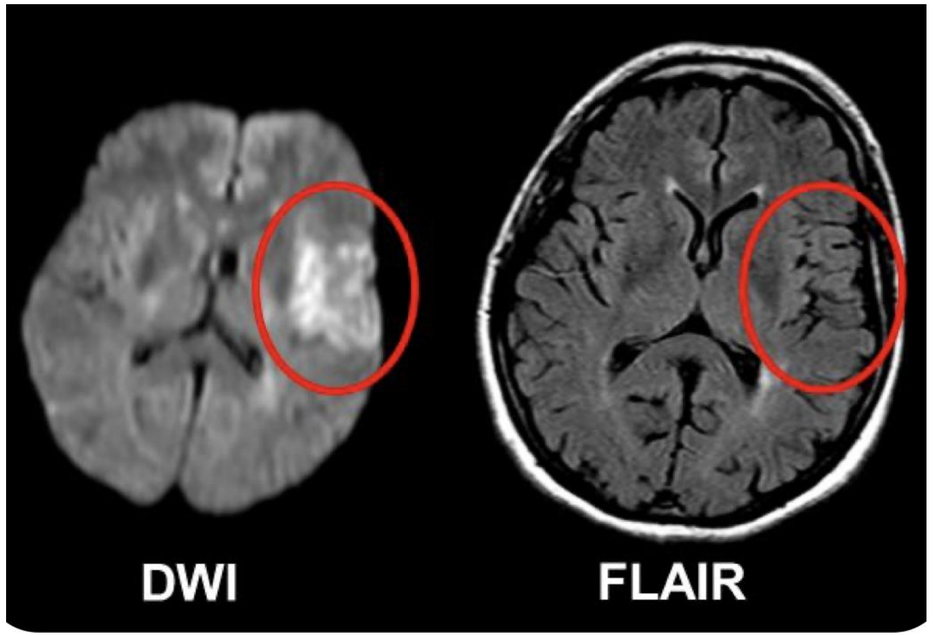
VÌ MỘT TRÁI TIM KHỎE

WAKE-UP

Intravenous Thrombolysis in Stroke Patients with Unknown Time of Symptom Onset

Illustrated imaging manual of the WAKE-UP trial

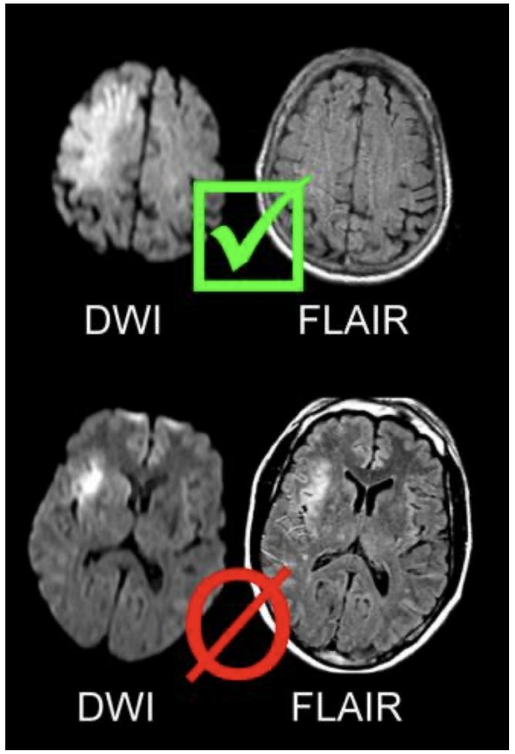
I. Galinovic, J.B. Fiebach, G. Thomalla, B. Cheng on behalf of the WAKE-UP Investigators



- Unknown onset stroke is a frequent condition: ~20% wake-up strokes, unwitnessed stroke with aphasia or disturbed level of consciousness
- No approval for alteplase in unknown time of symptom onset
- No proven treatment option exists for the large group of patients with unknown symptom onset stroke without large vessel occlusion
- MRI was suggested as surrogate marker of acute ischemic lesion <4.5 hours of symptom onset: "Mismatch" between an acute lesion on DWI but no clearly visible hyperintensity on FLAIR3

WAKE-UP TRIAL:
Mục tiêu + thiết kế

- **Aim**: To prove efficacy and safety of MRI-based thrombolysis in patients with unknown time of symptom onset
- **Design**: randomised, placebo-controlled clinical trial (Alteplase vs. Placebo 1:1)
- **Inclusion criteria**:
  - Acute stroke with unknown symptom onset, disabling neurological deficit
  - Last known well >4.5 hours (ie not eligible for IV alteplase by licence)
  - Age 18-80 years
  - Treatment can be started within 4.5 h of symptom recognition
  - Written informed consent
  - MRI completeted and indicative of lesion age ≤4.5 h: "DWI-FLAIR-mismatch"
- **Exclusion criteria**:
  - Planned thrombectomy
  - Any contradindication against treatment with alteplase (except for unknown time window)
- **Randomization**: 1:1 ratio to alteplase or placebo (alteplase 0.9 mg / kg of body weight (10% as bolus, the remainder by infusion over 60 min) or matching placebo)

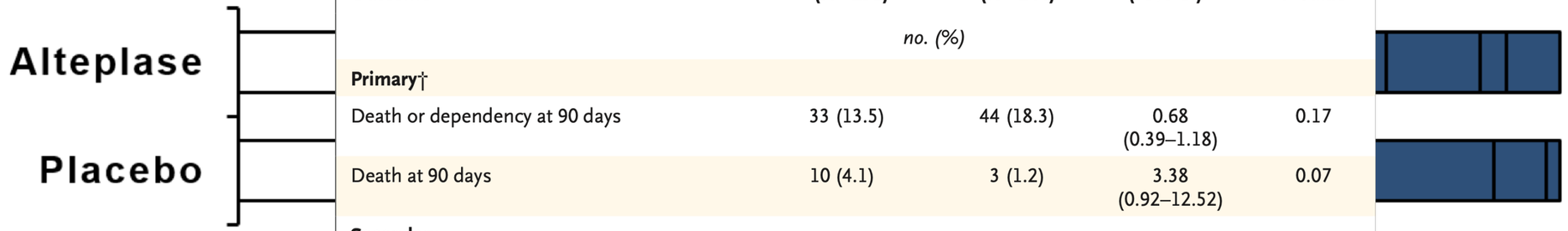


KẾT QUẢ WAKE-UP TRIAL

SAFETY ENDPOINTS

Table 3. Safety Outcomes.

Outcome	Alteplase Group (N=251)	Placebo Group (N=244)	Adjusted Odds Ratio (95% CI)*	P Value
	no. (%)			
Primary†				
Death or dependency at 90 days	33 (13.5)	44 (18.3)	0.68 (0.39–1.18)	0.17
Death at 90 days	10 (4.1)	3 (1.2)	3.38 (0.92–12.52)	0.07
Secondary				
Symptomatic intracranial hemorrhage				
As defined in SITS-MOST‡	5 (2.0)	1 (0.4)	4.95 (0.57–42.87)	0.15
As defined in ECASS II§	7 (2.8)	3 (1.2)	2.40 (0.60–9.53)	0.21
As defined in ECASS III¶	6 (2.4)	1 (0.4)	6.04 (0.72–50.87)	0.10
As defined in NINDS‖	20 (8.0)	12 (4.9)	1.78 (0.84–3.71)	0.13
Parenchymal hemorrhage type 2**	10 (4.0)	1 (0.4)	10.46 (1.32–82.77)	0.03



Endpoint	P-Value
Favorable outcom (mRS 0-1) at 90 da	0.02

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GUIDELINE: WAKE-UP Stroke

AHA/ASA Guideline

Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019 Update to the 2018 Guidelines for the Early Management of Acute Ischemic Stroke

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

3. IV alteplase (0.9 mg/kg, maximum dose 90 mg over 60 minutes with initial 10% of dose given as bolus over 1 minute) administered within 4.5 hours of stroke symptom recognition can be beneficial in patients with AIS who awake with stroke symptoms or have unclear time of onset >4.5 hours from last known well or at baseline state and who have a DW-MRI lesion smaller than one-third of the MCA territory and no visible signal change on FLAIR.	IIa	B-R

European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke

Recommendation

For patients with acute ischaemic stroke on awakening from sleep, who were last seen well more than 4.5 h earlier, who have MRI DWI-FLAIR mismatch, and for whom mechanical thrombectomy is either not indicated or not planned, we recommend intravenous thrombolysis with alteplase.

Quality of evidence: **High** ⊕⊕⊕⊕

Strength of recommendation: **Strong** ↑↑

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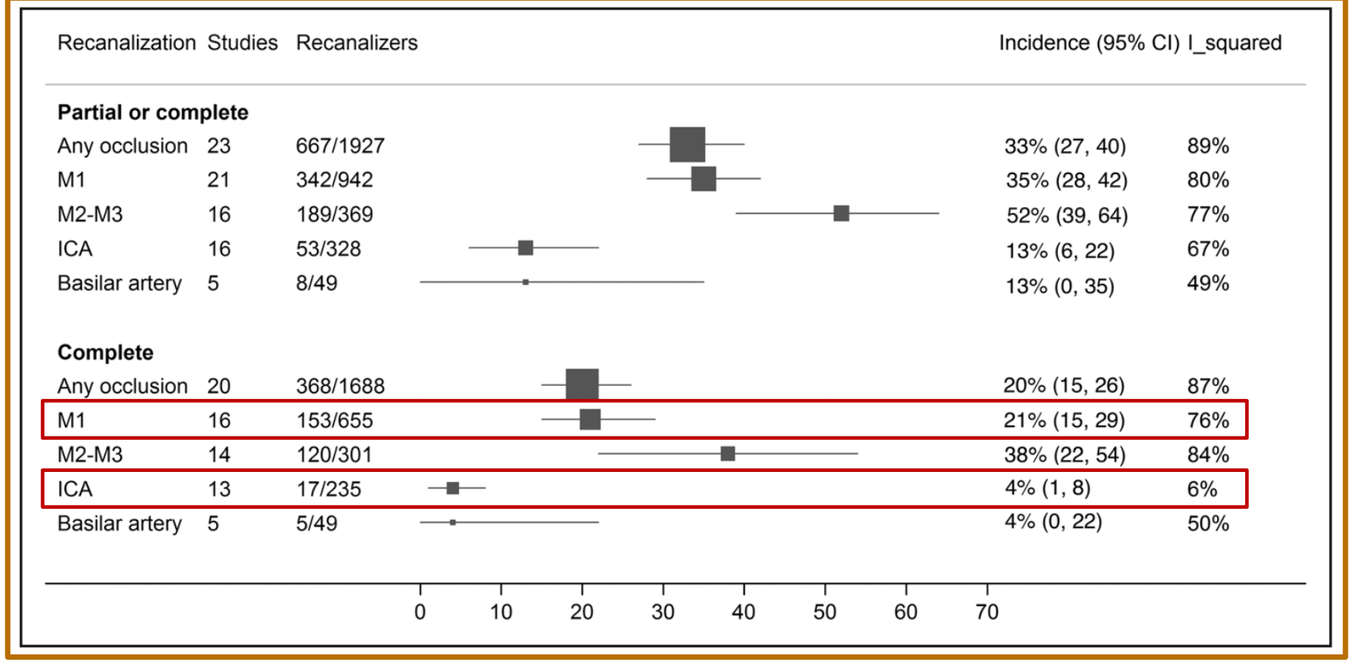
TIÊU SỢI HUYẾT
Hạn chế

Incidence and Predictors of Early Recanalization After Intravenous Thrombolysis

A Systematic Review and Meta-Analysis

Pierre Seners, MD*; Guillaume Turc, PhD*; Benjamin Maïer, MD; Jean-Louis Mas, MD; Catherine Oppenheim, PhD; Jean-Claude Baron, ScD



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CAN THIỆP LẤY HUYẾT KHỐI

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 C V Campbell, Robert J van Oostenbrugge, Jeffrey L Saver, Michael D Hill, Tudor G Jovin, for the HERMES collaborators

Summary

Background In 2015, five randomised trials showed efficacy of endovascular thrombectomy over standard medical care in patients with acute ischaemic stroke caused by occlusion of arteries of the proximal anterior circulation. In this meta-analysis we, the trial investigators, aimed to pool individual patient data from these trials to address remaining questions about whether the therapy is efficacious across the diverse populations included.

Lancet 2016; 387: 1723–31
Published Online
February 18, 2016
http://dx.doi.org/10.1016/S0140-6736(16)00163-X

ESCAPE
REVASCAT
MR CLEAN
A Multicenter Randomized CLinical trial of Endovascular treatment for Acute Ischemic stroke in the Netherlands
EXTEND-IA
SWIFT PRIME

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5 RCT lấy HK 2018

STUDY	AGE	TIME	TIÊU CHUẨN CHỌN BỆNH	IMAGING
MR CLEAN (The Netherlands)	≥ 18	6h	NIHSS > 2 CT không tính ASPECT	CT/CTA MRI/MRA
REVASCAT (Catalonia)	18-80	8h	NIHSS ≥ 6 ASPECT ≥ 6 (MRI) ASPECTS ≥ 7 (CT)	CT/MRI (DWI) CTA/MRA
ESCAPE (US, Canada, UK, South Korea)	≥ 18	8-12h	NIHSS ≥ 6 ASPECT ≥ 6 (CT) mCTA > 50% (THBH)	CT/CTA Multiphase CTA
EXTEND IA (Australia, New Zealand)	≥ 18	12h	NIHSS: none ASPECT: none (CT) Perfusion: Core – Tmax > 6s Core ≤ 70ml; Penum/Core > 1.2 Mismatch > 10ml	CT/MRI CTA/CTP
SWIFT PRIME (USA/EU)	18-85	6h	NIHSS 8-29 ASPECT ≥ 6 (CT) Perfusion: Mismatch (Core – Tmax > 10s)	CT/MRI (DWI/PWI) Rapid CTA/MRA

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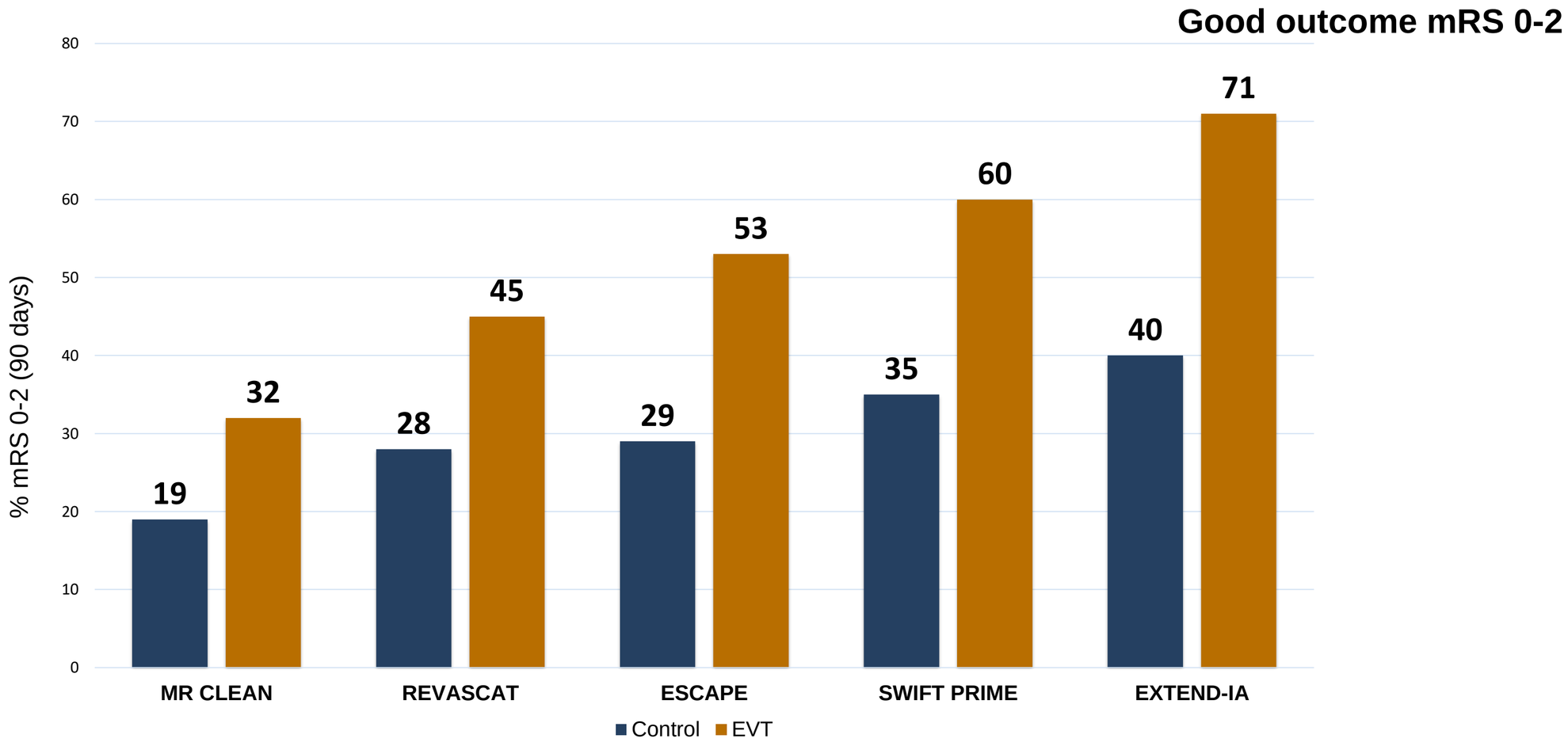
Kết quả các nghiên cứu lấy HK



NNT	8	6	4	4	3

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GUIDELINE LẤY HUYẾT KHỐI CỬA SỔ 0-6 GIỜ

AHA/ASA Guideline

2015 American Heart Association/American Stroke Association Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

The American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists.

Endorsed by the American Association of Neurological Surgeons (AANS); Congress of Neurological Surgeons (CNS); AANS/CNS Cerebrovascular Section; American Society of Neuroradiology; and Society of Vascular and Interventional Neurology

William J. Powers, MD, FAHA, Chair; Colin P. Derdeyn, MD, FAHA, Vice Chair; José Biller, MD, FAHA; Christopher S. Coffey, PhD; Brian L. Hoh, MD, FAHA; Edward C. Jauch, MD, MS, FAHA; Karen C. Johnston, MD, MSc; S. Claiborne Johnston, MD, PhD, FAHA; Alexander A. Khalessi, MD, MS, FAHA; Chelsea S. Kidwell, MD, FAHA; James F. Meschia, MD, FAHA; Bruce Ovbiagele, MD, MSc, MAS, FAHA; Dileep R. Yavagal, MD, MBBS; on behalf of the American Heart Association Stroke Council

Recommendations

Endovascular Interventions

1. **Patients eligible for intravenous r-tPA should receive intravenous r-tPA even if endovascular treatments are being considered *(Class I; Level of Evidence A)*.** (Unchanged from the 2013 guideline)
2. **Patients should receive endovascular therapy with a stent retriever if they meet all the following criteria *(Class I; Level of Evidence A)*.** (New recommendation):
   a. **Prestroke mRS score 0 to 1,**
   b. **Acute ischemic stroke receiving intravenous r-tPA within 4.5 hours of onset according to guidelines from professional medical societies,**
   c. **Causative occlusion of the ICA or proximal MCA (M1),**
   d. **Age ≥18 years,**
   e. **NIHSS score of ≥6,**
   f. **ASPECTS of ≥6, and**
   g. **Treatment can be initiated (groin puncture) within 6 hours of symptom onset**

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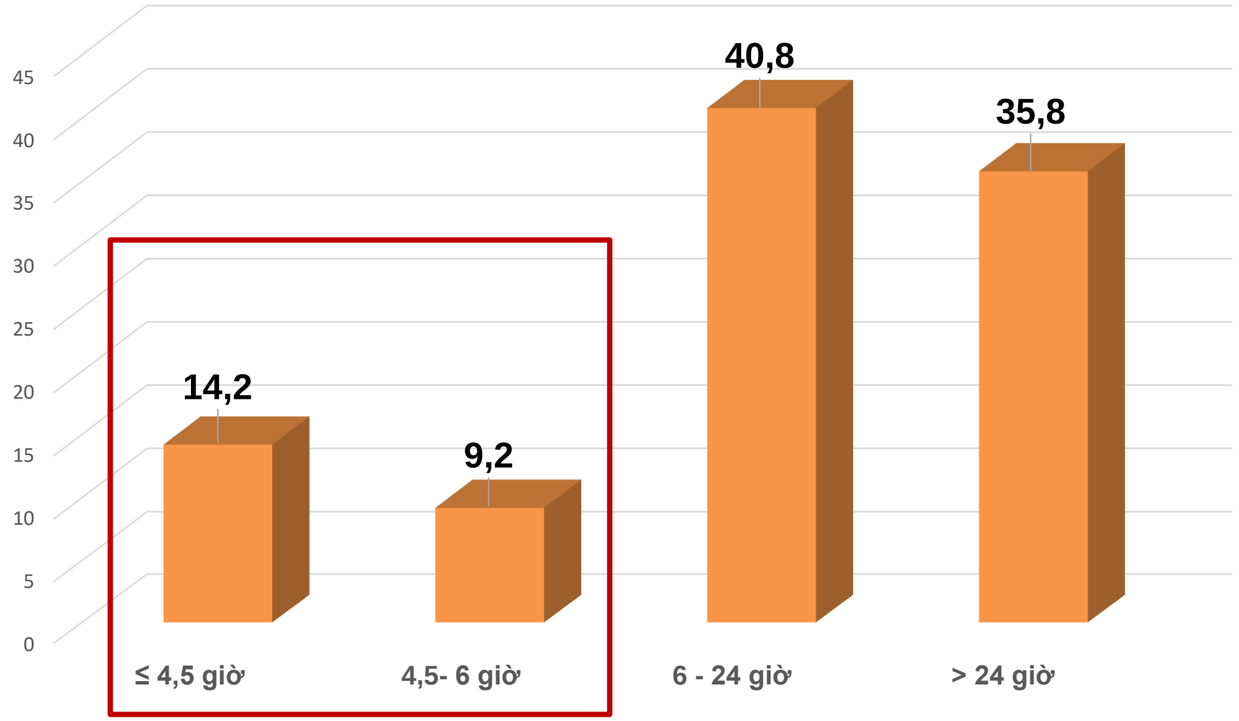
MỞ RỘNG CỬA SỔ ĐIỀU TRỊ

Tỷ lệ bệnh nhân nhập viện trong các cửa sổ thời gian (%)



Nha Dao, et al: CÁC YẾU TỐ ẢNH HƯỞNG ĐẾN THỜI GIAN NHẬP VIỆN Ở BỆNH NHÂN ĐỘT QUỴ

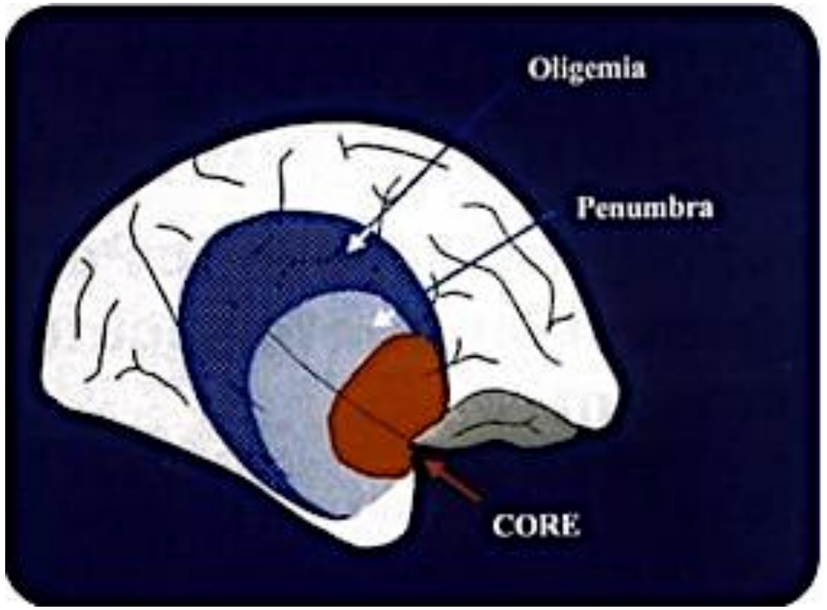
Cửa sổ mở rộng 6-24h

Time clock

Restricted to Time

VS

Tissue Clock



Restricted to the presence of penumbral tissue

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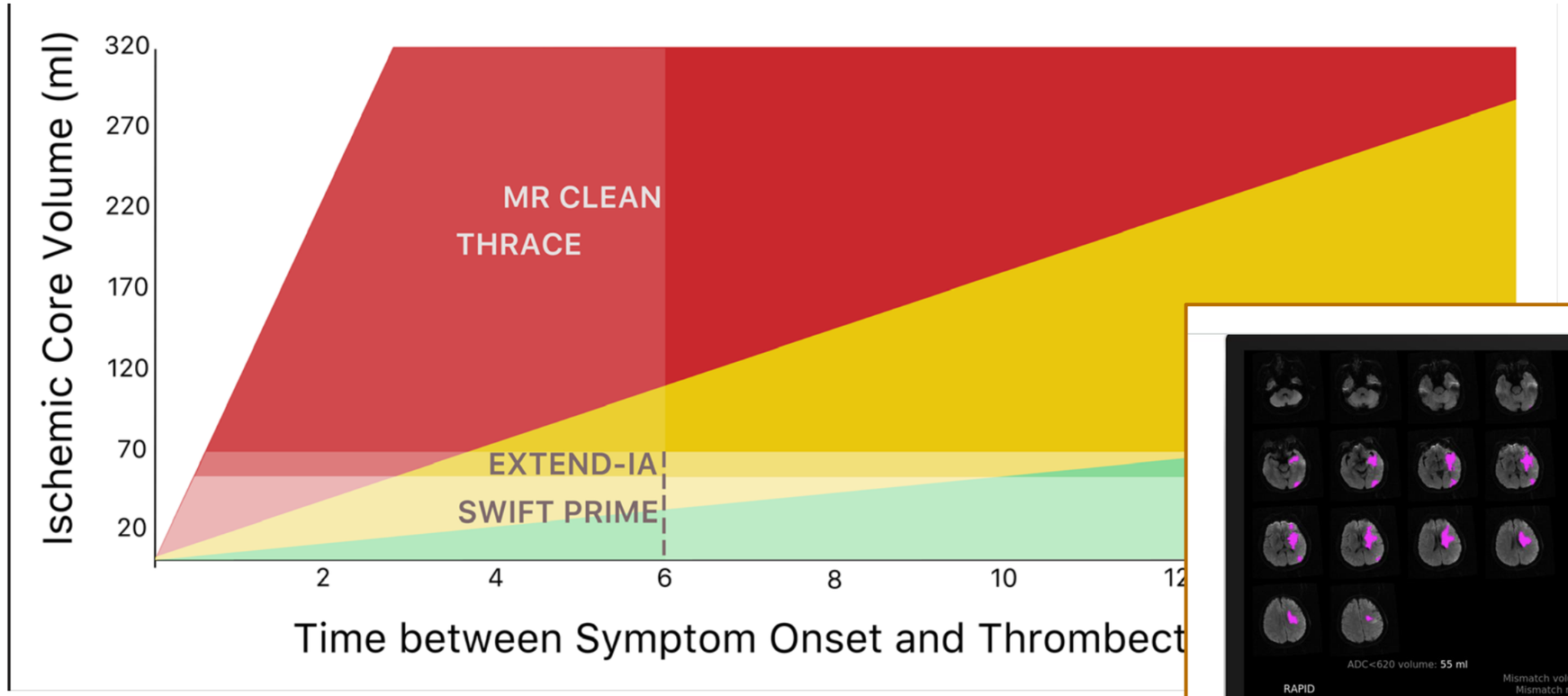
Tốc độ hoại tử nhu mô



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LẤY HK CỬA SỔ MỞ RỘNG 6-24 GIỜ

DAWN TRIAL

defuse·3

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 4, 2018 VOL. 378 NO. 1

Thrombectomy 6 to 24 Hours after Stroke with a Mismatch between Deficit and Infarct

R.G. Nogueira, A.P. Jadhav, D.C. Haussen, A. Bonafe, R.F. Budzik, P. Bhuva, D.R. Yavagal, M. Ribo, C. Cognard, R.A. Hanel, C.A. Sila, A.E. Hassan, M. Millan, E.I. Levy, P. Mitchell, M. Chen, J.D. English, Q.A. Shah, F.L. Silver, V.M. Pereira, B.P. Mehta, B.W. Baxter, M.G. Abraham, P. Cardona, E. Veznedaroglu, F.R. Hellinger, L. Feng, J.F. Kirmani, D.K. Lopes, B.T. Jankowitz, M.R. Frankel, V. Costalat, N.A. Vora, A.J. Yoo, A.M. Malik, A.J. Furlan, M. Rubiera, A. Aghaebrahim, J.-M. Olivot, W.G. Tekle, R. Shields, T. Graves, R.J. Lewis, W.S. Smith, D.S. Liebeskind, J.L. Saver, and T.G. Jovin, for the DAWN Trial Investigators*

ORIGINAL ARTICLE

Thrombectomy for Stroke at 6 to 16 Hours with Selection by Perfusion Imaging

G.W. Albers, M.P. Marks, S. Kemp, S. Christensen, J.P. Tsai, S. Ortega-Gutierrez, R.A. McTaggart, M.T. Torbey, M. Kim-Tenser, T. Leslie-Mazwi, A. Sarraj, S.E. Kasner, S.A. Ansari, S.D. Yeatts, S. Hamilton, M. Mlynash, J.J. Heit, G. Zaharchuk, S. Kim, J. Carrozzella, Y.Y. Palesch, A.M. Demchuk, R. Bammer, P.W. Lavori, J.P. Broderick, and M.G. Lansberg, for the DEFUSE 3 Investigators*

DAWN TRIAL:
Can thiệp lấy huyết khối trong cửa sổ 6-24h

Age ≥ 18
NIHSS ≥ 10
Pre-stroke mRS 0-1
< 1/3 MCA territory involved, as evidenced by CT or MRI
Occlusion of the intracranial ICA and/or MCA-M1, by MRA or CTA
Subject can be randomized within 6-24h from TLSW

Clinical Imaging Mismatch (CIM) defined as one of the following on RAPID MR-DWI or CTP-rCBF maps:

a. 0-20 cc core infarct & NIHSS ≥ 10 (& ≥ 80 yrs old)
b. 0-30 cc core infarct & NIHSS ≥ 10 (& < 80 yrs old)
c. 31 to ≤ 50 cc core infarct & NIHSS ≥ 20 (& < 80 yrs old)

https://www.nejm.org/doi/full/10.1056/NEJMoa1706442

DAWN
Kết quả

CONCLUSIONS

Among patients with acute stroke who had last been known to be well 6 to 24 hours earlier and who had a mismatch between clinical deficit and infarct, outcomes for disability at 90 days were better with thrombectomy plus standard care than with standard care alone. (Funded by Stryker Neurovascular; DAWN ClinicalTrials.gov number, NCT02142283.)

Khoah đỏ 9 2217 và 4-5-4

DEFUSE 3
Can thiệp lấy huyết khối trong cửa sổ 6-16h

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defuse·3

Tiêu chuẩn nhận bệnh

- Tuổi 18-90
- NIHSS ≥ 6
- mRS trước ĐQ: 0-1
- Khởi phát : 6-16 giờ

Tiêu chuẩn hình ảnh

- Có các ĐM cảnh trong và/hoặc ĐM não giữa M1
- RAPID
  - ***Infarct volume (ischemic core) < 70 ml***
  - ***Mismatch Ratio ≥ 1.8***
  - ***Mismatch volume ≥ 15 ml***

So sánh

- Lấy huyết khối bằng dụng cụ bất kỳ (FDA approved)
- Điều trị nội khoa

Tiêu chuẩn hình ảnh DEFUSE 3

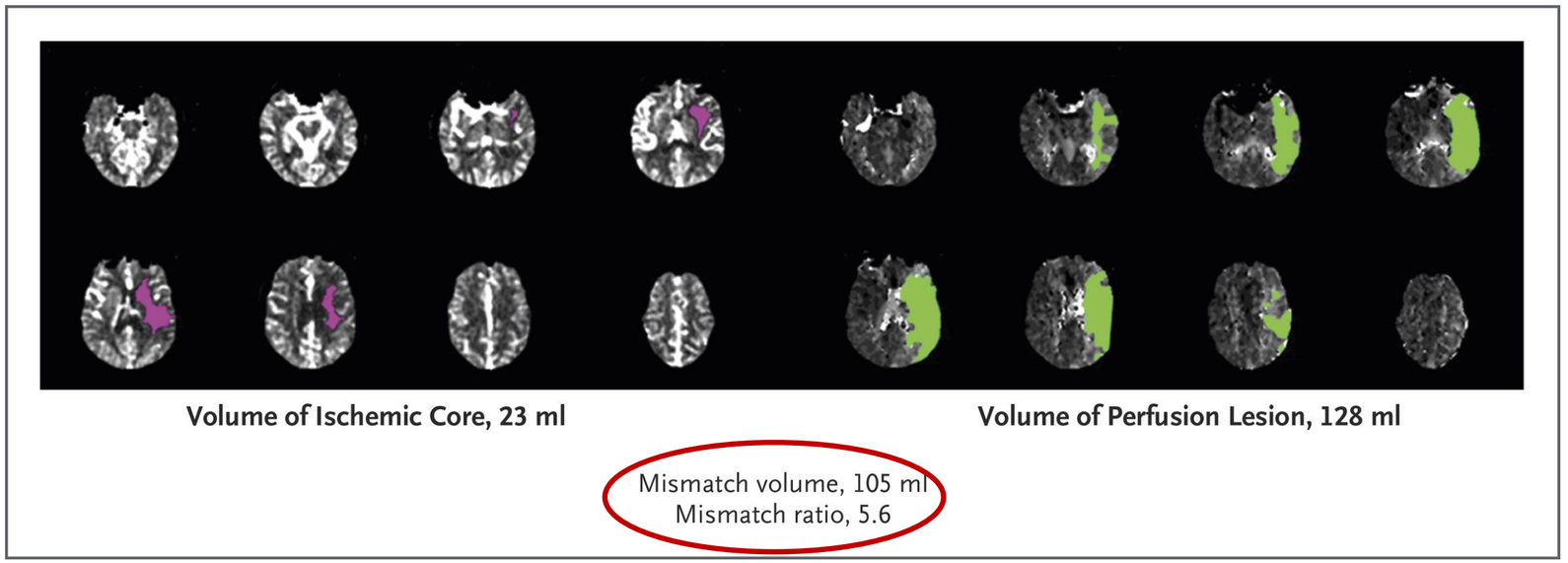
Key Neuroimaging Inclusion Criteria

1) Occlusion of the ICA and/or MCA M1

AND

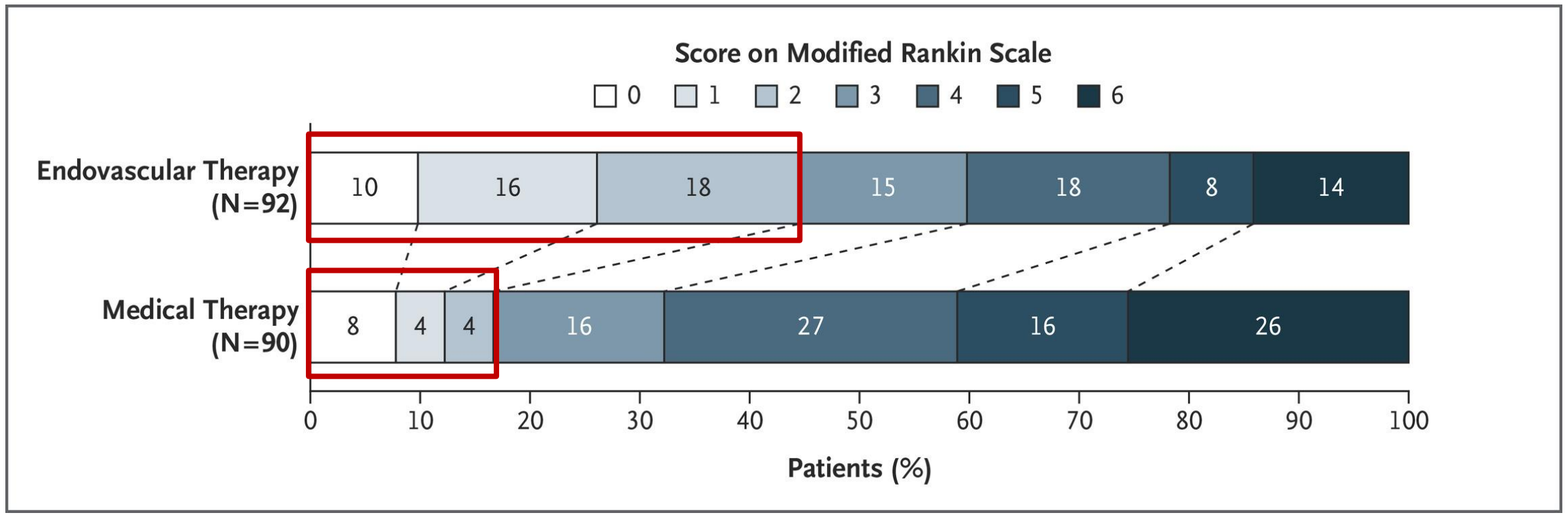
2) **RADID** Target Mismatch Profile with core up to 70ml

Substantially more patients eligible



DEFUSE 3:
Kết quả

Results: Primary Outcome



Odds ratio: **2.8 (1.6)** **P<0.0001**

Number needed to treat: **3**

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AN TOÀN: DAWN + DEFUSE 3

Table 3. Safety Outcomes.*

Outcome	Thrombectomy Group (N=107)	Control Group (N=99)	Absolute Difference (95% CI)	Risk Ratio (95% CI)
	no. (%)		*percentage points*	
Stroke-related death at 90 days	17 (16)	18 (18)	−2 (−13 to 8)	1 (1 to 2)
Death from any cause at 90 days	20 (19)	18 (18)	1 (−10 to 11)	1 (1 to 2)
Symptomatic intracranial hemorrhage at 24 hr†	6 (6)	3 (3)	3 (−3 to 8)	2 (1 to 7)
Neurologic deterioration at 24 hr‡	15 (14)	26 (26)	−12 (−23 to −1)	1 (0 to 1)
Procedure-related complications	7 (7)	NA		
Distal embolization in a different territory	4 (4)	NA		
Intramural arterial dissection	2 (2)	NA		
Arterial perforation	0	NA		
Access-site complications leading to intervention	1 (1)	NA		

Safety outcomes — no. (%)				
Death at 90 days	13 (14)	23 (26)	0.55 (0.30–1.02)	0.05
Symptomatic intracranial hemorrhage‖	6 (7)	4 (4)	1.47 (0.40–6.55)	0.75
Early neurologic deterioration	8 (9)	11 (12)	0.71 (0.30–1.69)	0.44
Parenchymal hematoma type 2	8 (9)	3 (3)	2.61 (0.73–14.69)	0.21

DAWN (6-24h)

DEFUSE 3 (6-16h)

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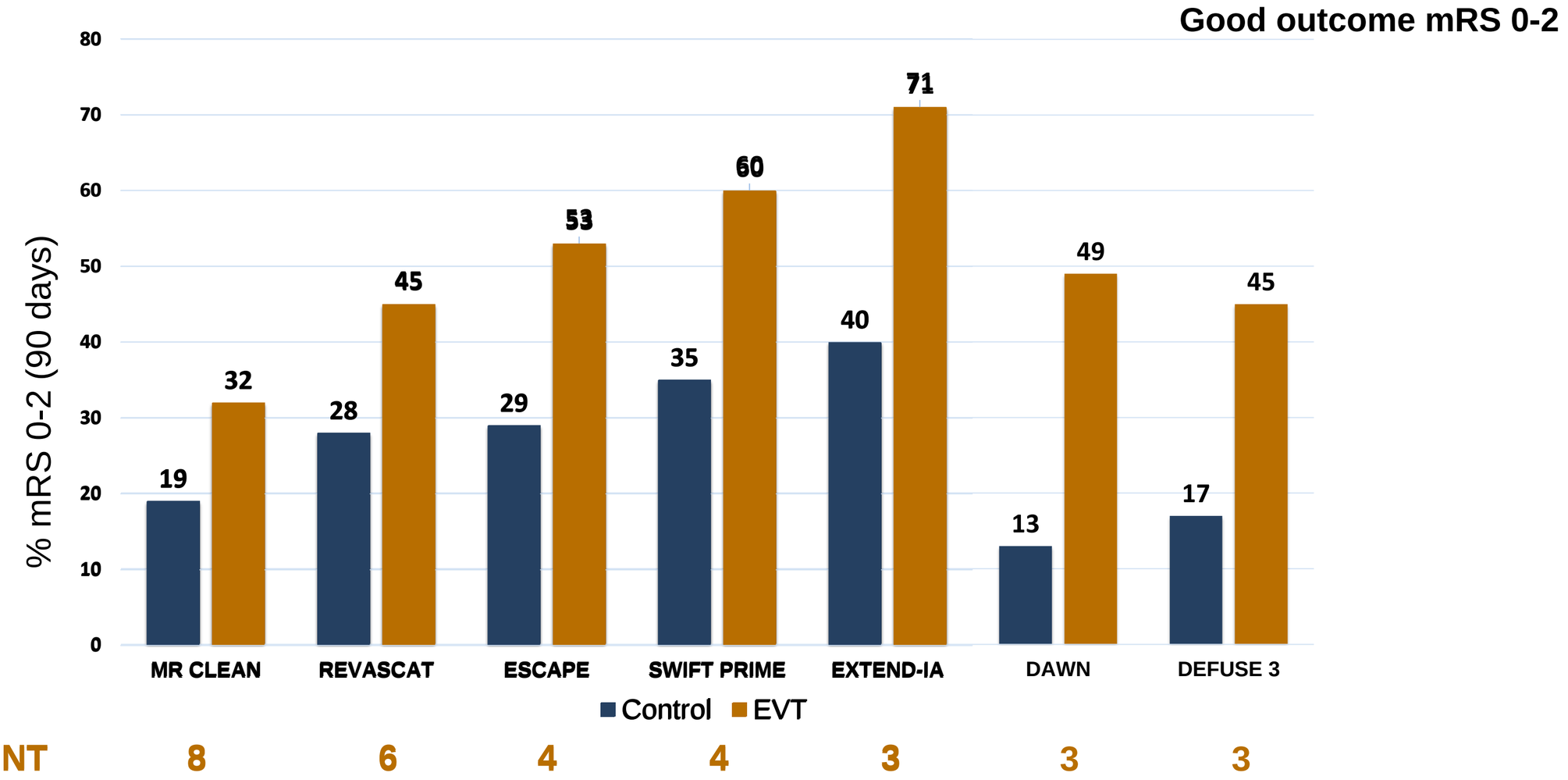
Kết quả các nghiên cứu lấy HK



NNT	8	6	4	4	3	3	3

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GUIDELINE:
Mở rộng cửa sổ lấy huyết khối 6-24 giờ

In selected patients with AIS within 6 to 16 hours of last known normal who have LVO in the anterior circulation and meet other DAWN or DEFUSE 3 eligibility criteria, mechanical thrombectomy is recommended.	**I**	**A**
In selected patients with AIS within 16 to 24 hours of last known normal who have LVO in the anterior circulation and meet other DAWN eligibility criteria, mechanical thrombectomy is reasonable.	**IIa**	**B-R**

Clinical imaging mismatch (CIM) defined as one of the following on MR-DWI or CTP-rCBF maps:

a. ≥ 80 y/o, NIHSS ≥10 + core <21 mL
b. < 80 y/o, NIHSS ≥10 + core <31 mL
c. < 80 y/o, NIHSS ≥20 + core <51 mL

DAWN

ICA or MCA-M1 occlusion (carotid occlusions can be cervical or intracranial; with or without tandem MCA lesions) by MRA or CTA

Target Mismatch Profile on CT perfusion or MRI (ischemic core volume is <70 ml, mismatch ratio is ≥1.8 and mismatch volume is ≥15 ml)

DEFUSE 3

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CAN THIỆP LÕI LỚN:
N/c RESCUE-JAPAN LIMIT

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 7, 2022 VOL. 386 NO. 14

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

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N/c RESCUE-JAPAN LIMIT

Table 1. Demographic and Clinical Characteristics of the Patients at Baseline.*

Variable	Endovascular-Therapy Group (N=101)	Medical-Care Group (N=102)
Age — yr	76.6±10.0	75.7±10.2
Male sex — no. (%)	55 (54.5)	58 (56.9)
Median modified Rankin scale score before stroke (IQR)†	0 (0–1)	0 (0–1)
Median NIHSS score at baseline (IQR)‡	22 (18–26)	22 (17–26)
Occlusion site — no. (%)§		
Internal carotid artery	47 (46.5)	49 (48.0)
M1 segment	74 (73.3)	70 (68.6)
M2 segment	0	3 (2.9)
Tandem lesion of internal carotid artery and M1 segment of the middle cerebral artery	20 (19.8)	20 (19.6)
Patients with an ASPECTS value based on MRI — no.	88	87
Patients with an ASPECTS value based on CT — no.	13	15
ASPECTS¶		
Median value (IQR)	3 (3–4)	4 (3–4)
0–2 — no. (%)	5 (5.0)	3 (2.9)
3 — no. (%)	51 (50.5)	47 (46.1)
4 — no. (%)	25 (24.8)	32 (31.4)
5 — no. (%)	20 (19.8)	20 (19.6)
Median infarction volume (IQR) — ml	94 (66–152)	110 (74–140)
Intravenous rt-PA use — no. (%)	27 (26.7)	29 (28.4)

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Table 1. Demographic and Clinical Characteristics of the Patients at Baseline.*		
Median interval between time of stroke onset and hospital arrival (IQR) — min	190 (85–390)	170 (83–335)
Patients with an interval of <120 min between time of stroke onset and hospital arrival — no. (%)	36 (35.6)	35 (34.3)
Median interval between time of stroke onset and time of imaging (IQR) — min	181 (101–413)	170 (103–350)
Interval between time of stroke onset and time of randomization		
Median (IQR) — min	229 (144–459)	214 (142–378)
<4.5 hr — no. (%)	56 (55.4)	67 (65.7)
4.5 to <6.0 hr — no. (%)	15 (14.9)	7 (6.9)
6.0 to <12.0 hr — no. (%)	18 (17.8)	13 (12.7)
12.0 to 24.0 hr — no. (%)	12 (11.9)	15 (14.7)
Median interval between time of stroke onset and puncture time (IQR) — min	254 (165–479)	NA
Median interval between time of stroke onset and time of reperfusion (IQR) — min	308 (213–503)	NA
TICI reperfusion grade ≥2b — no./total no. (%)‖	86/100 (86.0)	NA

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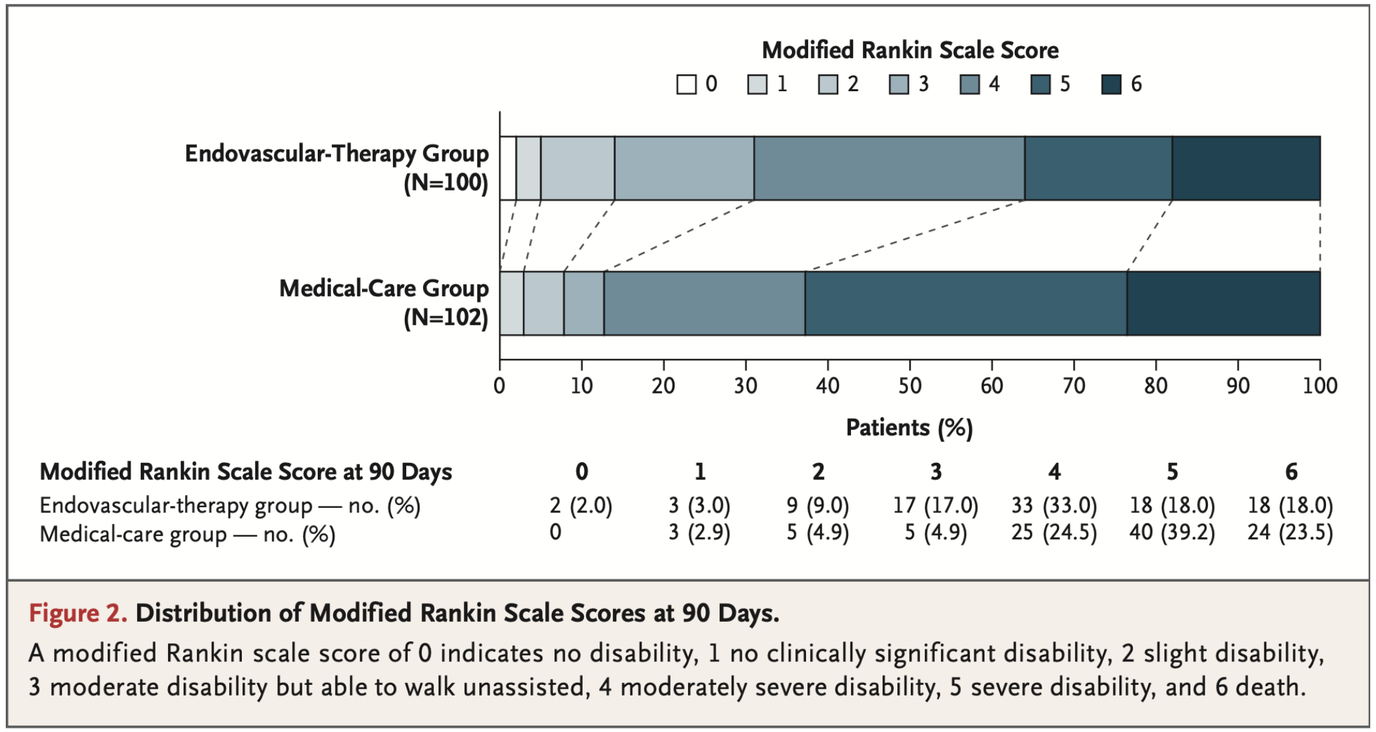
Table 2. Trial Outcomes.

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)	8 (7.8)	1.79 (0.78–4.07)	
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
Death within 90 days	18 (18.0)	24 (23.5)	0.77 (0.44–1.32)	0.33
Recurrence of cerebral infarction within 90 days	5 (5.0)	7 (6.9)	0.73 (0.24–2.22)	0.58
Decompressive craniectomy within 7 days	10 (10.0)	14 (13.7)	0.73 (0.34–1.56)	0.41

CAN THIỆP LÕI LỚN:
N/c RESCUE-JAPAN LIMIT



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)

Figure 2. Distribution of Modified Rankin Scale Scores at 90 Days.

A modified Rankin scale score of 0 indicates no disability, 1 no clinically significant disability, 2 slight disability, 3 moderate disability but able to walk unassisted, 4 moderately severe disability, 5 severe disability, and 6 death.

CONCLUSIONS

In a trial conducted in Japan, patients with large cerebral infarctions had better functional outcomes with endovascular therapy than with medical care alone but had more intracranial hemorrhages. (Funded by Mihara Cerebrovascular Disorder Research Promotion Fund and the Japanese Society for Neuroendovascular Therapy; RESCUE-Japan LIMIT ClinicalTrials.gov number, NCT03702413.)

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CAN THIỆP LỖI LỚN:
SELECT 2

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 6, 2023 VOL. 388 NO. 14

Trial of Endovascular Thrombectomy for Large Ischemic Strokes

A. Sarraj, A.E. Hassan, M.G. Abraham, S. Ortega-Gutierrez, S.E. Kasner, M.S. Hussain, M. Chen, S. Blackburn, C.W. Sitton, L. Churilov, S. Sundararajan, Y.C. Hu, N.A. Herial, P. Jabbour, D. Gibson, A.N. Wallace, J.F. Arenillas, J.P. Tsai, R.F. Budzik, W.J. Hicks, O. Kozak, B. Yan, D.J. Cordato, N.W. Manning, M.W. Parsons, R.A. Hanel, A.N. Aghaebrahim, T.Y. Wu, P. Cardona-Portela, N. Pérez de la Ossa, J.D. Schaafsma, J. Blasco, N. Sangha, S. Warach, C.D. Gandhi, T.J. Kleinig, D. Sahlein, L. Elijovich, W. Tekle, E.A. Samaniego, L. Maali, M.A. Abdulrazzak, M.N. Psychogios, A. Shuaib, D.K. Pujara, F. Shaker, H. Johns, G. Sharma, V. Yogendrakumar, F.C. Ng, M.H. Rahbar, C. Cai, P. Lavori, S. Hamilton, T. Nguyen, J.T. Fifi, S. Davis, L. Wechsler, V.M. Pereira, M.G. Lansberg, M.D. Hill, J.C. Grotta, M. Ribo, B.C. Campbell, and G.W. Albers, for the SELECT2 Investigators*

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SELECT 2

Aim:

Trials of the efficacy and safety of endovascular thrombectomy in patients with large ischemic strokes have been carried out in limited populations.

Trial Design:

Prospective randomized, open-label phase III multicenter international trial with blinded endpoint assessment that enrolled 352 patients with AIS due to proximal occlusion in ICA or first segment of MCA, who demonstrated large ischemic core on non-contrast CT (ASPECTS 3-5), perfusion imaging (tissue volume with relative cerebral blood flow <30% of 50 ml or larger) or MRI (tissue volume with apparent diffusion coefficient of 620 x 10-6 mm2/s of 50 ml or larger) and randomly assigned to EVT + best medical care (EVT) or best medical care only (MM) if EVT was feasible within 24 hours of last known to be well. EVT provided by the means of stent retrievers, aspiration devices, or a combination thereof with devices approved by local regulatory bodies.

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SELECT 2:
Đặc điểm dân số ng/c

Table 1. Baseline Characteristics of the Patients (Intention-to-Treat Population).*

Characteristic	Endovascular Thrombectomy (N=178)	Medical Care (N=174)
Median age (IQR) — yr	66 (58–75)	67 (58–75)
Female sex — no. (%)	71 (39.9)	74 (42.5)
Race or ethnic group — no. (%)†		
American Indian or Alaska Native	0	1 (0.6)
Asian	5 (2.8)	3 (1.7)
Black	26 (14.6)	24 (13.8)
White	132 (74.2)	130 (74.7)
Native Hawaiian or Pacific Islander	2 (1.1)	0
Other or unknown	13 (7.3)	16 (9.2)
Previous ischemic stroke — no. (%)	19 (10.7)	13 (7.5)
Right hemisphere affected — no. (%)	98 (55.1)	98 (56.3)
Occlusion location — no. (%)‡		
Internal carotid artery	80 (44.9)	66 (37.9)
M1 segment	91 (51.1)	100 (57.5)
M2 segment	7 (3.9)	8 (4.6)
Tandem occlusions — no. of patients (%)	56 (31.5)	44 (25.3)
Transfer to center with endovascular thrombectomy capabilities — no. (%)	106 (59.6)	105 (60.3)
Intravenous thrombolysis — no./total no. (%)	37/178 (20.8)	30/173 (17.3)
Median NIHSS score at hospital arrival (IQR)§	19 (15–23)	19 (15–22)
General anesthesia performed — no. (%)	104/177 (58.8)	—
Median interval between time that patient was last known to be well and randomization (IQR) — hr	9.07 (5.27–15.33)	9.79 (5.82–15.32)

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SELECT 2:
Đặc điểm dân số ng/c

Table 1. Baseline Characteristics of the Patients (Intention-to-Treat Population).*

Median interval between hospital arrival and imaging (IQR) — min		
CT	16 (9–27)	15 (7–24)
CT perfusion or MRI	26 (17–41)	25 (13–36)
Median interval between hospital arrival and arterial puncture (IQR) — min	109 (76–138)	—
Median interval between arterial puncture and reperfusion or end of procedure (IQR) — min	38 (25–61)	—
Median ASPECTS value on baseline CT imaging (IQR)¶	4 (3–5)	4 (4–5)
Imaging method used to estimate ischemic-core volume — no./total no. (%)		
CT perfusion	174/177 (98.3)	169/174 (97.1)
Diffusion-weighted MRI	3/177 (1.7)	5/174 (2.9)
Median estimated ischemic-core volume (IQR) — ml‖		
Overall	74 (50–111.5)	77 (50.3–105)
CT perfusion	81.5 (59–119)	79 (62–111)
Diffusion-weighted MRI	82 (56–89)	86 (84–104)
Median volume of critically hypoperfused lesion (IQR) — ml**	171 (127–226)	169 (127–216)
Median volume of tissue with Tmax of >10 sec (IQR) — ml	107 (70.5–152.5)	111 (67–147)

Đặc điểm nền tương đồng giữa 2 nhóm

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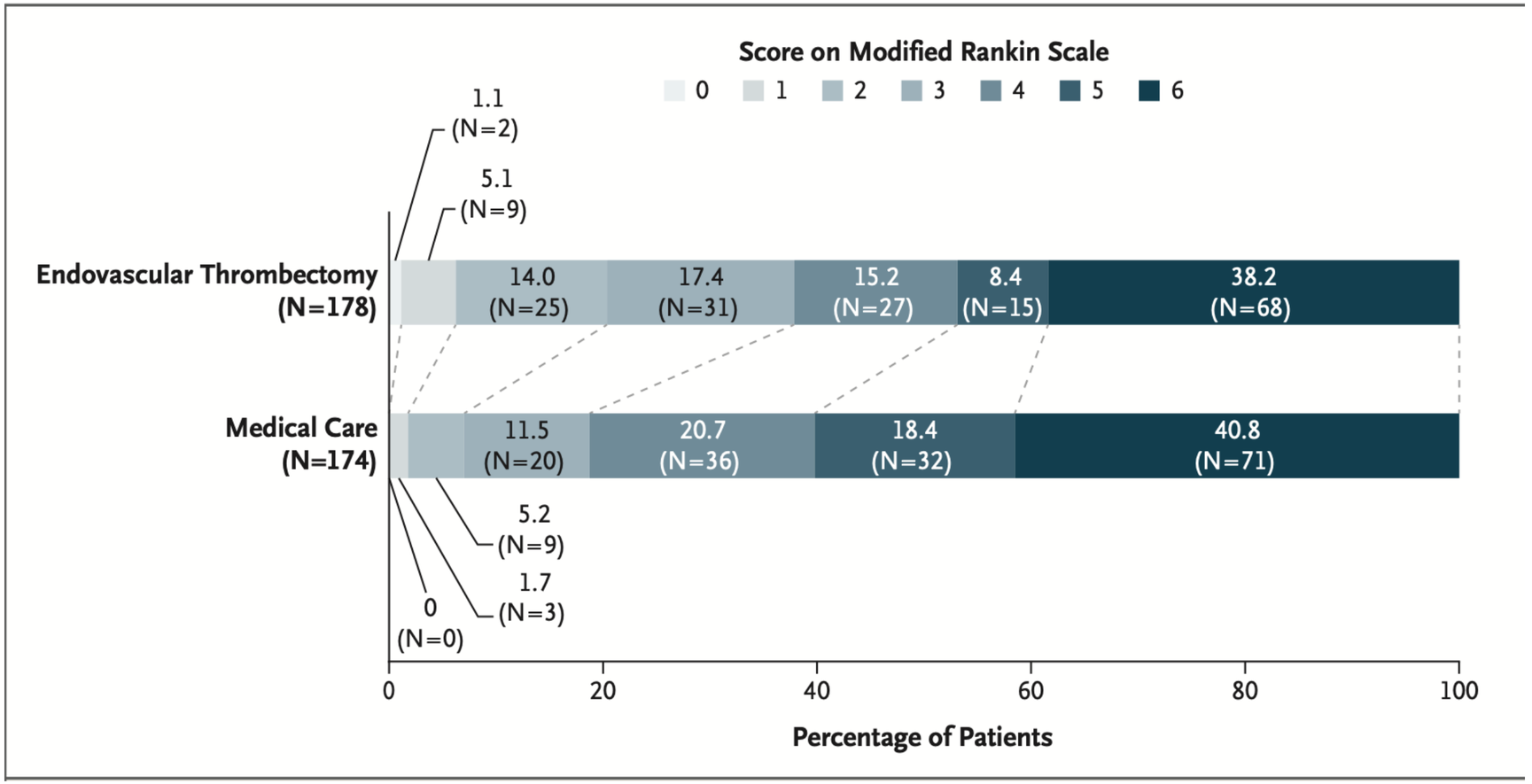
SELECT2: PRIMARY OUTCOME



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Kết quả SELECT2: PRIMARY OUTCOME & SECONDARY OUTCOME

Table 2. Clinical Outcomes (Intention-to-Treat Population).*

Variable	Endovascular Thrombectomy (N=178)	Medical Care (N=174)	Effect Size (95% CI)
Primary outcome			
Median score on modified Rankin scale at 90 days (IQR)†	4 (3–6)	5 (4–6)	1.51 (1.20 to 1.89)‡
Secondary clinical outcomes			
Functional independence at 90 days — no./total no. (%)§	36/177 (20.3)	12/171 (7.0)	2.97 (1.60 to 5.51)¶
Independent ambulation at 90 days — no./total no. (%)‖	67/177 (37.9)	32/171 (18.7)	2.06 (1.43 to 2.96)¶
Successful reperfusion — no. (%)**	142 (79.8)	—	
Discharge location — no. (%)			
Home	19 (10.7)	10 (5.7)	
Acute care facility	11 (6.2)	16 (9.2)	
Inpatient rehabilitation facility	72 (40.4)	65 (37.4)	
Skilled nursing facility	23 (12.9)	20 (11.5)	
Hospice or home hospice	11 (6.2)	19 (10.9)	
In-hospital death	42 (23.6)	44 (25.3)	
Early neurologic improvement — no./total no. (%)††	20/174 (11.5)	13/172 (7.6)	1.47 (0.76 to 2.87)¶
Median quality-of-life scores (IQR)‡‡			
Mobility domain	35.2 (23.9 to 43.9)	25.1 (16.5 to 33.0)	10.10 (5.02 to 15.18)§§
Depression domain	47.9 (43.1 to 54.3)	53.6 (46.8 to 57.4)	–5.70 (–8.83 to –2.57)‖
Social domain	37.1 (32.7 to 42.0)	33.5 (27.7 to 37.8)	3.60 (1.11 to 6.09)‖
Cognitive domain	41.9 (35.0 to 49.6)	37.9 (30.9 to 42.9)	4.00 (0.51 to 7.49)‖

mRS 0-2: NNT=7.5

mRS 0-3: NNT=5.2

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Kết quả SELECT2: An toàn

Table 3. Safety Outcomes and Procedural Complications (Intention-to-Treat Population).*

Outcome	Endovascular Thrombectomy (N=178)	Medical Care (N=174)	Relative Risk (95% CI)
Symptomatic intracranial hemorrhage within 24 hr — no. (%)†	1 (0.6)	2 (1.1)	0.49 (0.04 to 5.36)
Early neurologic worsening — no. (%)‡	44 (24.7)	27 (15.5)	1.59 (1.03 to 2.45)
Death from any cause within 90 days — no./total no. (%)	68/177 (38.4)	71/171 (41.5)	0.91 (0.71 to 1.18)
Arterial access-site complications — no. (%)			
Occlusion	3 (1.7)	—	
Hematoma	1 (0.6)	—	
Infection	1 (0.6)	—	
Vascular injury — no. (%)			
Dissection	10 (5.6)	—	
Perforation	7 (3.9)	—	
Vasospasm	11 (6.2)	—	
Other	2 (1.1)	—	

- Xuất huyết nội sọ không tăng thêm ở nhóm can thiệp
- Tiến triển thần kinh xấu hơn sớm tăng ở nhóm can thiệp
- Tử vong trong 90 ngày không khác biệt giữa 2 nhóm
- 20% BN gặp các biến chứng liên quan thủ thuật

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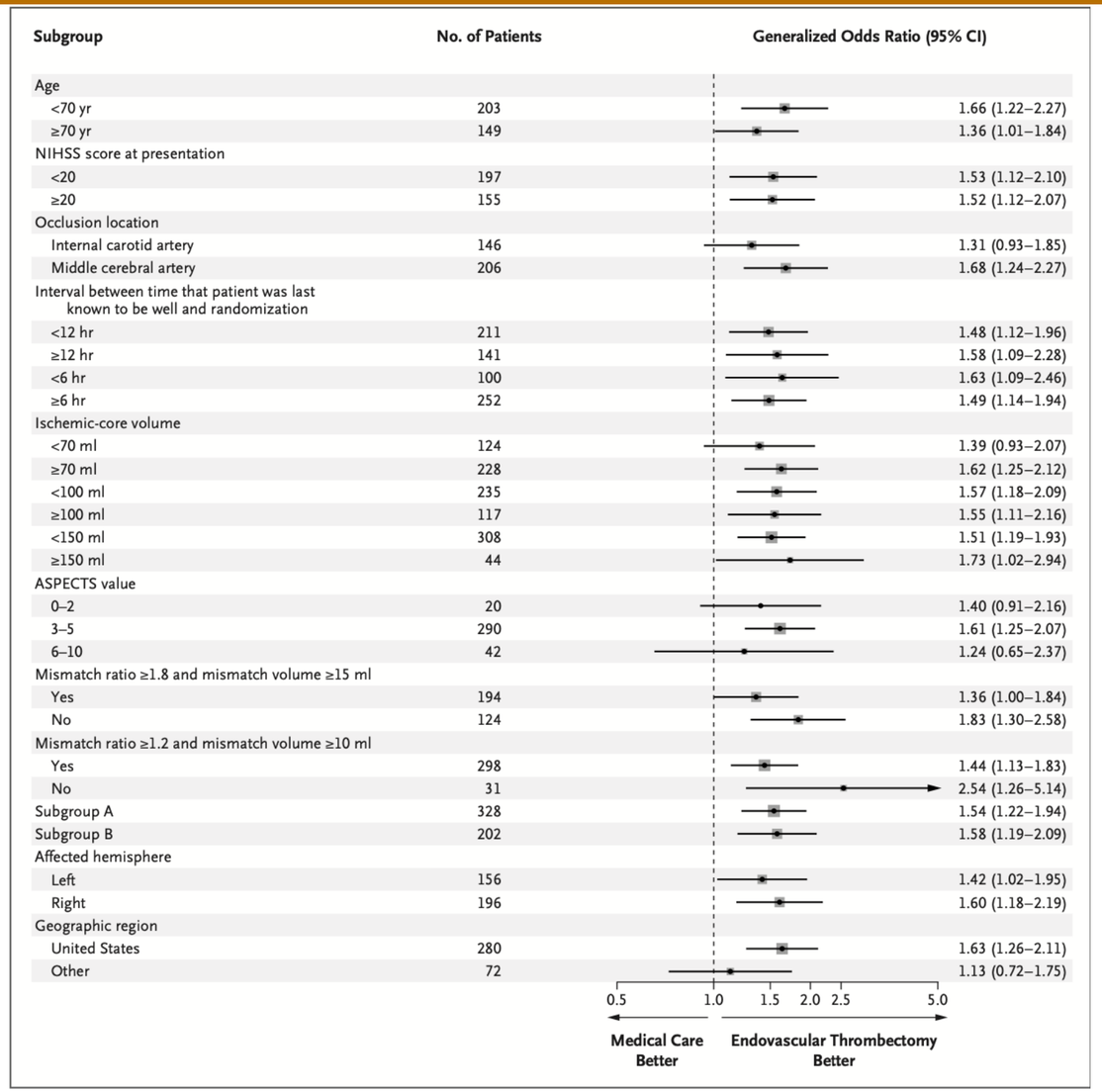
Phân tích dưới nhóm SELECT2

Kết cục lâm sàng lệch về hướng có lợi hơn ở nhóm can thiệp lấy huyết khối



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Can thiệp lõi lớn: ANGEL-ASPECT TRIAL

ORIGINAL ARTICLE

Trial of Endovascular Therapy for Acute Ischemic Stroke with Large Infarct

X. Huo, G. Ma, X. Tong, X. Zhang, Y. Pan, T.N. Nguyen, G. Yuan, H. Han, W. Chen, M. Wei, Jiangang Zhang, Z. Zhou, X. Yao, G. Wang, W. Song, X. Cai, G. Nan, D. Li, A.Y.-C. Wang, W. Ling, C. Cai, C. Wen, E. Wang, L. Zhang, C. Jiang, Y. Liu, G. Liao, X. Chen, T. Li, S. Liu, J. Li, F. Gao, N. Ma, D. Mo, L. Song, X. Sun, X. Li, Y. Deng, G. Luo, M. Lv, H. He, A. Liu, Jingbo Zhang, S. Mu, Lian Liu, J. Jing, X. Nie, Z. Ding, W. Du, X. Zhao, P. Yang, Liping Liu, Yilong Wang, D.S. Liebeskind, V.M. Pereira, Z. Ren, Yongjun Wang, and Z. Miao, for the ANGEL-ASPECT Investigators*

ANGEL-ASPECT TRIAL

METHODS

Inclusion criteria

- Age: 18-80 years
- NIHSS: 6-30 at admission
- Pre-stroke mRS 0-1
- Occlusion of the ICA (distal) or M1 segment of MCA (or both) on CTA/MRA
- ASPECTS 3-5 or ASPECT < 3 and core 70-100 ml

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Table 1. Demographic and Clinical Characteristics of the Patients at Baseline.*

Characteristic	Endovascular Therapy (N = 230)	Medical Management (N = 225)
Median age (IQR) — yr	68 (61–73)	67 (59–73)
Male sex — no. (%)	135 (58.7)	144 (64.0)
Median NIHSS score at admission (IQR)†	16 (13–20)	15 (12–19)
Occlusion site — no. (%)‡		
ICA	83 (36.1)	81 (36.0)
M1 segment	145 (63.0)	142 (63.1)
M2 segment	2 (0.9)	2 (0.9)
Ipsilateral extracranial ICA occlusion	41 (17.8)	35 (15.6)
ASPECTS value based on CT§		
Median value (IQR)	3 (3–4)	3 (3–4)
Distribution — no. (%)		
0	6 (2.6)	2 (0.9)
1	13 (5.7)	20 (8.9)
2	13 (5.7)	8 (3.6)
3	98 (42.6)	100 (44.4)
4	64 (27.8)	47 (20.9)
5	36 (15.7)	48 (21.3)
Median infarct-core volume (IQR) — ml¶	60.5 (29–86)	63 (31–86)

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Median infarct-core volume (IQR) — ml¶	60.5 (29–86)	63 (31–86)
Intravenous thrombolysis — no. (%)	66 (28.7)	63 (28.0)
Awoke with stroke symptoms — no. (%)	69 (30.0)	78 (34.7)
Median interval between stroke onset and hospital arrival (IQR) — min	338 (199–629)	341 (182–652)
Median interval between stroke onset and imaging (IQR) — min	397 (242–677)	412 (241–741)
Interval between stroke onset and randomization		
Median (IQR) — min	453 (299–712)	463 (305–781)
Distribution — no. (%)		
<4.5 hr	46 (20.0)	51 (22.7)
4.5 to <6.0 hr	36 (15.7)	34 (15.1)
6.0 to <12.0 hr	92 (40.0)	76 (33.8)
12.0 to 24.0 hr	56 (24.3)	64 (28.4)

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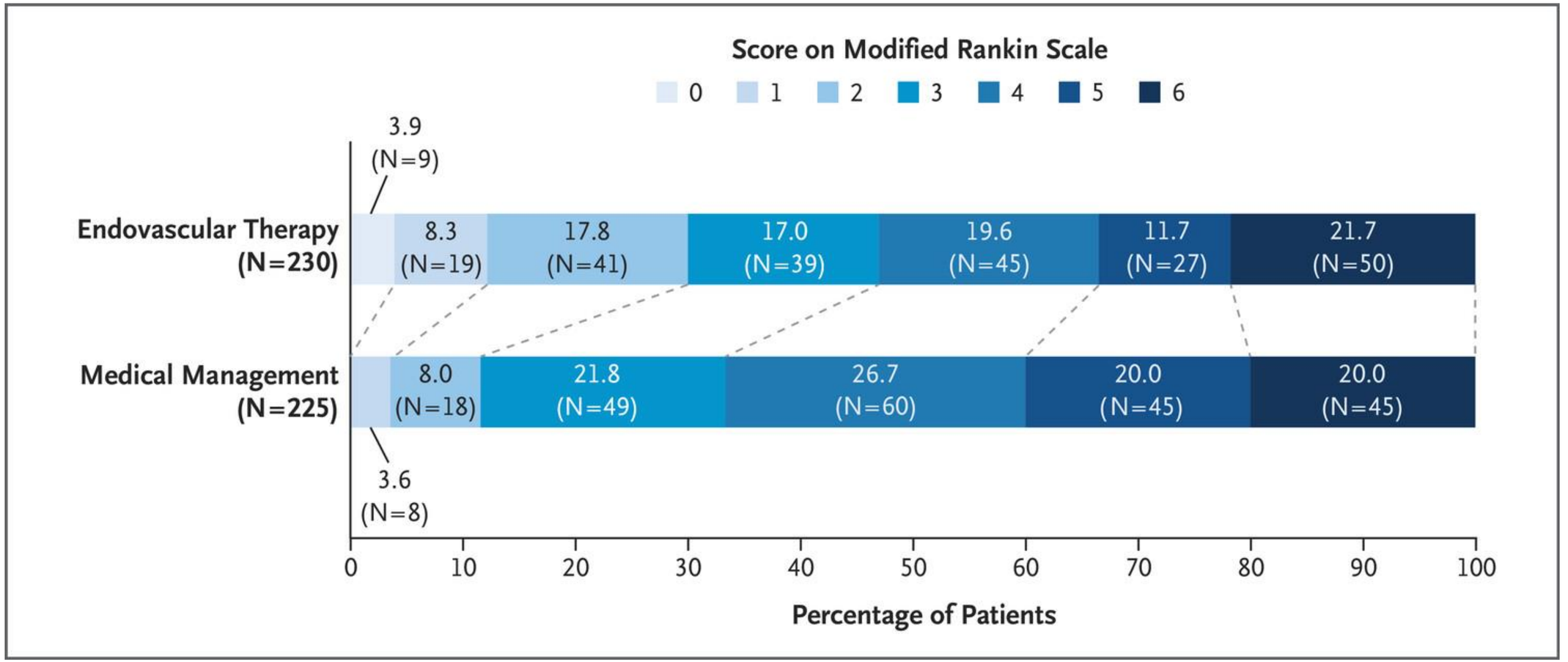
ANGEL-ASPECT TRIAL



[OR = 1,37; 1,11 – 1,69]; P = 0.004

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ANGEL-ASPECT TRIAL

Table 2. Efficacy and Safety Outcomes.

Outcome	Endovascular Therapy (N=230)	Medical Management (N=225)	Treatment Effect (95% CI)*	P Value
Primary outcome				
Score on the modified Rankin scale at 90 days†	4 (2 to 5)	4 (3 to 5)	1.37 (1.11 to 1.69)	0.004
Secondary outcomes				
Score on the modified Rankin scale at 90 days — no. (%)†				
0 to 2	69 (30.0)	26 (11.6)	2.62 (1.69 to 4.06)	
0 to 3	108 (47.0)	75 (33.3)	1.50 (1.17 to 1.91)	
NIHSS score of 0 or 1 or improvement in score by ≥10 points at 36 hr — no. (%)‡	13 (5.7)	4 (1.8)	4.29 (1.28 to 14.46)	
Change from baseline in infarct-core volume§	61.7 (29.7 to 136.5)	90.5 (40.7 to 150.8)	−6.63 (−23.38 to 10.11)	
Target-artery recanalization at 36 hr — no. (%)¶	169 (85.8)	67 (36.4)	2.46 (1.96 to 3.08)	
Safety outcomes				
Symptomatic intracranial hemorrhage within 48 hr — no. (%)‖	14 (6.1)	6 (2.7)	2.07 (0.79 to 5.41)	0.12
Any intracranial hemorrhage within 48 hr — no. (%)	113 (49.1)	39 (17.3)	2.71 (1.91 to 3.84)	<0.001
Death within 90 days — no. (%)	50 (21.7)	45 (20.0)	1.00 (0.65 to 1.54)	0.99
Decompressive hemicraniectomy during hospitalization — no. (%)	17 (7.4)	8 (3.6)	1.92 (0.78 to 4.73)	0.15

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New Large Core Trials
EVT vs BMT up to 24 hours

1. RESCUE Japan LIMIT
2. SELECT 2
3. ANGEL-ASPECT (China)
4. TESLA
5. TENSION
6. LASTE

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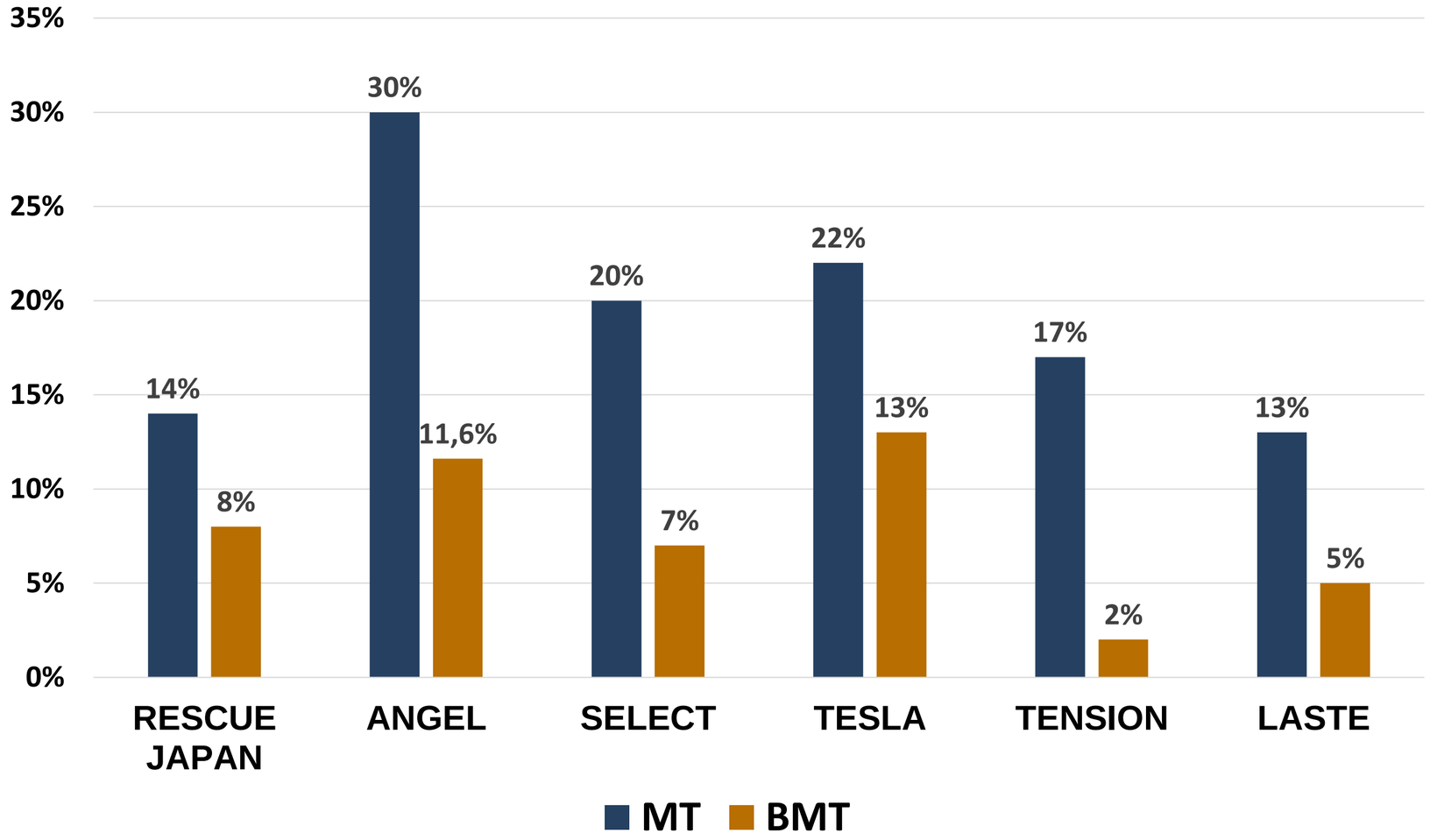
TUY NHIÊN…

Large Core Trials 3-month mRS 0-2



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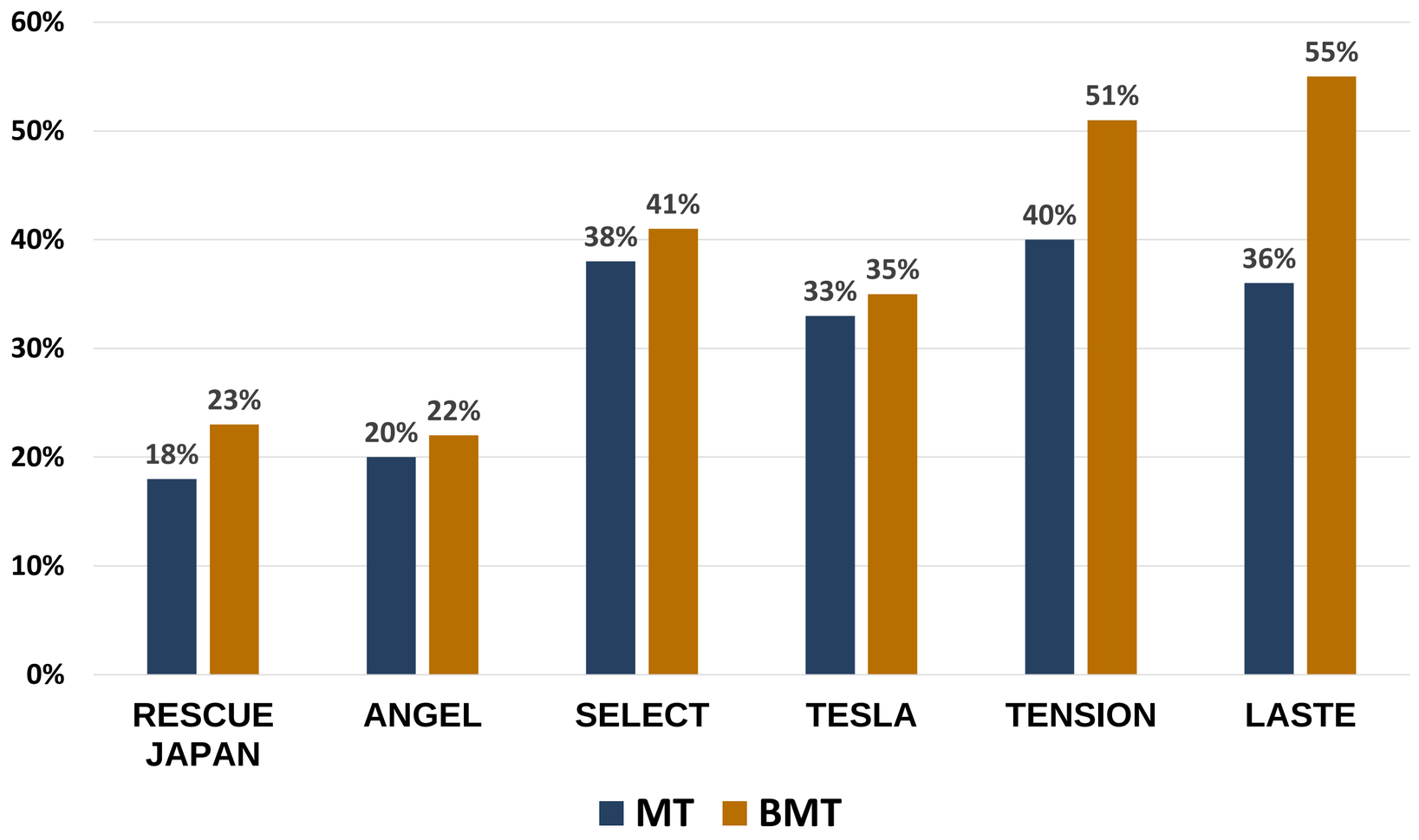
TUY NHIÊN…



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KẾT LUẬN

- Tiêu sợi huyết đường tĩnh mạch và can thiệp lấy huyết khối băng dụng cụ là điều trị chuẩn cho các bệnh nhân đột quỵ trong cửa sổ 4.5 giờ và 6 giờ
- Bệnh nhân đột quỵ thức giấc vào viện có thể được hưởng lợi ích từ TSH nếu có bất tương xứng trên hình ảnh cộng hưởng từ
- Mở rộng cửa sổ LHK 6-24 giờ chứng minh lợi ích với vai trò của CDHA nâng cao, và các nghiên cứu đang thực hiện cố gắng mở rộng qua 24 giờ
- ASPECT 3-5: can thiệp lấy HK cải thiện tiên lượng so với điều trị nội khoa đơn thuần, tuy nhiên tỉ lê tàn phế và tử vong của nhóm bn này còn cao

THANK YOU!

For Your Attention