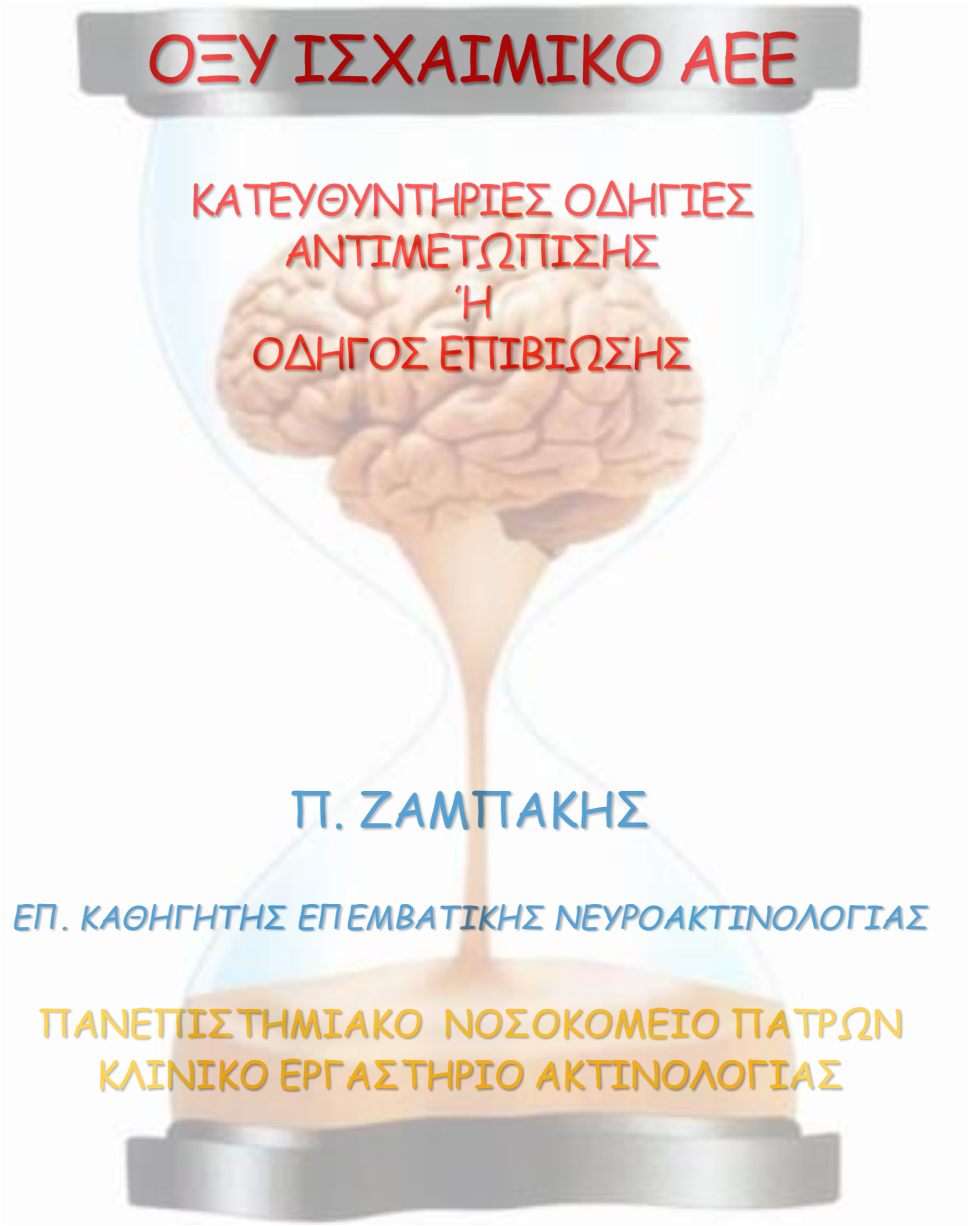
ΟΞΥ ΙΣΧΑΙΜΙΚΟ ΑΕΕ

ΚΑΤΕΥΘΥΝΤΗΡΙΕΣ ΟΔΗΓΙΕΣ ΑΝΤΙΜΕΤΩΠΙΣΗΣ Ή ΟΔΗΓΟΣ ΕΠΙΒΙΩΣΗΣ



Π. ΖΑΜΠΑΚΗΣ

ΕΠ. ΚΑΘΗΓΗΤΗΣ ΕΠΕΜΒΑΤΙΚΗΣ ΝΕΥΡΟΑΚΤΙΝΟΛΟΓΙΑΣ

ΠΑΝΕΠΙΣΤΗΜΙΑΚΟ ΝΟΣΟΚΟΜΕΙΟ ΠΑΤΡΩΝ
ΚΛΙΝΙΚΟ ΕΡΓΑΣΤΗΡΙΟ ΑΚΤΙΝΟΛΟΓΙΑΣ

ΑΕΕ

- Παγκόσμιο ιατρικό πρόβλημα και απόλυτα ιατρικό επείγον συμβάν
- Ο ακρογωνιαίος λίθος για την καλή έκβαση είναι η **έγκαιρη** επαναιμάτωση της ισχαιμικής περιοχής με την απομάκρυνση του θρόμβου
- Προς αυτήν την κατεύθυνση έχει γίνει μεγάλη πρόοδος
  - Έγκαιρη διάγνωση (ευαισθητοποίηση του κοινού, ΕΚΑΒ)
  - Κατάλληλη και άμεση θεραπεία
  - Αποθεραπεία

ΤΙ ΓΙΝΕΤΑΙ ΣΗΜΕΡΑ?

- **ΧΡΥΣΗ ΔΕΚΑΕΤΙΑ ΕΝΔΑΓΓΕΙΑΚΗΣ ΘΕΡΑΠΕΙΑΣ ΑΕΕ**
- **Απεικόνιση στο οξύ ΙΑΕΕ**
  - Εφαρμογή σύγχρονων τεχνικων
    - CTA/ CTP
    - αυτοματοποιημένο MR perfusion software-RAPID
- **Τεχνικές μηχανικής απομάκρυνσης θρόμβου**
  - Μεγάλες βελτιώσεις τα τελευταία χρόνια
  - Διαφορετικές συσκευές
  - Απόκτηση εμπειρίας
- **Ενδείξεις για ενδαγγειακή θεραπεία**
  - Νεώτερα δεδομένα
  - Αλλαγές στις οδηγίες

ΑΝΤΙΜΕΤΩΠΙΣΗ ΑΕΕ

- ΚΑΤΕΥΘΥΝΤΗΡΙΕΣ ΟΔΗΓΙΕΣ
  - ΘΕΡΑΠΕΙΑΣ
  - ΟΡΓΑΝΩΣΗΣ ΚΕΝΤΡΩΝ
  - ΠΟΙΟΤΙΚΑ ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΑΝΑΓΚΑΙΟΥ ΠΡΟΣΩΠΙΚΟΥ

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

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

O.A. Berkhemer, P.S.S. Fransen, D. Beumer, L.A. van den Berg, H.F. Lingsma, W.J. Schonewille, J.A. Vos, P.J. Nederkoorn, M.J.H. Wermer, M.A.A. van Walderveen, J. Staals, J. Hofmeijer, J.A. van Oostayen, G.J. Lycklama à Nijeholt, J. Boiten, P.A. Brouwer, B.J. Emmer, S.F. de Bruijn, L.C. van Dijk, L.J. Kappelle, R.H. Lo, E.J. van Dijk, J. de Vries, P.L.M. de Kort, W.J.J. van Rooij, J.S.P. van den Berg, B.A.A.M. van Hasselt, L.A.M. Aerden, R.J. Dallinga, M.C. Visser, J.C.J. Bot, P.C. Vroomen, O. Eshghi, T.H.C.M.L. Schreuder, R.J.J. Heijboer, K. Keizer, A.V. Tielbeek, H.M. den Hertog, D.G. Gerrits, R.M. van den Berg-Vos, G.B. Karas, E.W. Steyerberg, H.Z. Flach, H.A. Marquering, M.E.S. Sprengers, S.F.M. Jenniskens, L.F.M. Beenen, R. van den Berg, P.J. Koudstaal, W.H. van Zwam, Y.B.W.E.M. Roos, A. van der Lugt, R.J. van Oostenbrugge, C.B.L.M. Majoie, and D.W.J. Dippel, for the MR CLEAN Investigators*

ORIGINAL ARTICLE

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

M. Goyal, A.M. Demchuk, B.K. Menon, M. Eesa, J.L. Rempel, J. Thornton, D. Roy, T.G. Jovin, R.A. Willinsky, B.L. Sapkota, D. Dowlatshahi, D.F. Frei, N.R. Kamal, W.J. Montanera, A.Y. Poppe, K.J. Ryckborst, F.L. Silver, A. Shuaib, D. Tarr, D. Williams, O.Y. Bang, B.W. Baxter, P.A. Burns, H. Choe, J.-H. Heo, C.A. Holmstedt, B. Jankowitz, M. Kelly, G. Linares, J.L. Mandzia, J. Shamy, S.-I. Sohn, R.H. Swartz, P.A. Barber, S.B. Coutts, E.E. Smith, W.F. Morrish, A. Weill, S. Subramaniam, A.P. Mitha, J.H. Wong, M.W. Lowerison, T.T. Sajobi, and M.D. Hill for the ESCAPE Trial Investigators*

ORIGINAL ARTICLE

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection

B.C.V. Campbell, P.J. Mitchell, T.J. Kleinig, H.M. Dewey, L. Churilov, N. Yassi, B. Yan, R.J. Dowling, M.W. Parsons, T.J. Oxley, T.Y. Wu, M. Brooks, M.A. Simpson, F. Miteff, C.R. Levi, M. Krause, T.J. Harrington, K.C. Faulder, B.S. Steinfort, M. Priglinger, T. Ang, R. Scroop, P.A. Barber, B. McGuinness, T. Wijeratne, T.G. Phan, W. Chong, R.V. Chandra, C.F. Bladin, M. Badve, H. Rice, L. de Villiers, H. Ma, P.M. Desmond, G.A. Donnan, and S.M. Davis, for the EXTEND-IA Investigators*

NEJM Jan-Feb 2015

Table 1 Details of the nine positive thrombectomy trials

Trial	Trial dates	Centres	Participants	Primary outcome measure	Age (years)	Onset of symptoms		
						IV r-tPA	MT	NIHSS
MR CLEAN[35]	2010–14	16	502	mRS at 90 days	≥18	≤4.5	≤6	>1
REVASCAT[36]*	2012–14	4	206	mRS at 90 days	18–80‡	≤4.5	≤8	>5
EXTEND 1A[37]†	2012–14	10	70	Reperfusion at 24 hours, NIHSS at day 3	≥18	≤4.5	≤6	No restriction
SWIFT-prime[38]†	2012–14	39	196	mRS at 90 days	18–80	≤3.5	≤6	8–29
ESCAPE[39]†	2013–14	22	316	mRS at 90 days	≥18	≤4.5	≤12	>5
THRACE[40]†	2010–15	26	402	mRS≤2 at 90 days	18–80	≤4	≤5	10–25
THERAPY[41]*	2012–14	36	108	mRS≤2 at 90 days	18–85	≤4.5§	≤8¶	>7
PISTE[42]	2013–15	10	65	mRS≤2 at 90 days	≥18	≤4.5	6	No restriction
EASI[43]*	2013–14	1	77	mRS≤2 at 3 months	≥18	<3	≤6	>7**

Guidelines

EUROPEAN STROKE JOURNAL

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

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DOI: 10.1177/2396987319832140
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Eur Stroke J Feb 2019

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

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

DEFUSE 3 Investigators, NEJM, Jan 24, 2018

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE FREE PREVIEW

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

Raul G. Nogueira, M.D., Ashutosh P. Jadhav, M.D., Ph.D., Diogo C. Haussen, M.D., Alain Bonafe, M.D., Ronald F. Budzik, M.D., Parita Bhuva, M.D., Dileep R. Yavagal, M.D., Marc Ribo, M.D., Christophe Cognard, M.D., Ricardo A. Hanel, M.D., Cathy A. Sila, M.D., Ameer E. Hassan, D.O., et al., for the DAWN Trial Investigators*

AHA/ASA Guideline

2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

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

Reviewed for evidence-based integrity and endorsed by the American Association of Neurological Surgeons and Congress of Neurological Surgeons

Endorsed by the Society for Academic Emergency Medicine

William J. Powers, MD, FAHA, Chair; Alejandro A. Rabinstein, MD, FAHA, Vice Chair; Teri Ackerson, BSN, RN; Opeolu M. Adeoye, MD, MS, FAHA; Nicholas C. Bambakidis, MD, FAHA; Kyra Becker, MD, FAHA; José Biller, MD, FAHA; Michael Brown, MD, MSc; Bart M. Demaerschalk, MD, MSc, FAHA; Brian Hoh, MD, FAHA; Edward C. Jauch, MD, MS, FAHA; Chelsea S. Kidwell, MD, FAHA; Thabele M. Leslie-Mazwi, MD; Bruce Ovbiagele, MD, MSc, MAS, MBA, FAHA; Phillip A. Scott, MD, MBA, FAHA; Kevin N. Sheth, MD, FAHA; Andrew M. Southerland, MD, MSc; Deborah V. Summers, MSN, RN, FAHA; David L. Tirschwell, MD, MSc, FAHA; on behalf of the American Heart Association Stroke Council

Stroke March 2018

CURRENT STATUS

3.5. IV Alteplase

3.5. IV Alteplase	COR	LOE	New, Revised, or Unchanged
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 may 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 6 to determine patient eligibility.	I	A	Recommendation reworded for clarity from 2013 AIS Guidelines. Class and LOE unchanged. See Table LXXXIII in online Data Supplement 1 for original wording.
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. Physicians should review the criteria outlined in Table 6 determine patient eligibility.	I	B-R	Recommendation reworded for clarity from 2013 AIS Guidelines. Class unchanged. LOE amended to conform with ACC/AHA 2015 Recommendation Classification System. See Table LXXXIII in online Data Supplement 1 for original wording.
3. For otherwise eligible patients with mild stroke presenting in the 3- to 4.5-hour window, treatment with IV alteplase may be reasonable. Treatment risks should be weighed against possible benefits.	IIb	B-NR	New recommendation.
4. In otherwise eligible patients who have had a previously demonstrated small number (1–10) of CMBs on MRI, administration of IV alteplase is reasonable.	IIa	B-NR	New recommendation.
5. In otherwise eligible patients who have had a previously demonstrated high burden of CMBs (>10) on MRI, treatment with IV alteplase may be associated with an increased risk of sICH, and the benefits of treatment are uncertain. Treatment may be reasonable if there is the potential for substantial benefit.	IIb	B-NR	New recommendation.

CURRENT STATUS

7. Abciximab should not be administered concurrently with IV alteplase.	**III: Harm**	**B-R**	Recommendation revised from 2013 AIS Guidelines.
8. IV alteplase should not be administered to patients who have received a treatment dose of low-molecular-weight heparin (LMWH) within the previous 24 hours.	**III: Harm**	**B-NR**	Recommendation reworded for clarity from 2015 IV Alteplase. Class and LOE amended to conform with ACC/AHA 2015 Recommendation Classification System. See Table LXXXIII in online Data Supplement 1 for original wording.
11. Treating clinicians should be aware that hypoglycemia and hyperglycemia may mimic acute stroke presentations and determine blood glucose levels before IV alteplase initiation. IV alteplase is not indicated for nonvascular conditions.	**III: No Benefit**	**B-NR**	Recommendation reworded for clarity from 2015 IV Alteplase. Class and LOE amended to conform with ACC/AHA 2015 Recommendation Classification System. See Table LXXXIII in online Data Supplement 1 for original wording.
12. Because time from onset of symptoms to treatment has such a powerful impact on outcomes, treatment with IV alteplase should not be delayed to monitor for further improvement.	**III: Harm**	**C-EO**	Recommendation wording modified from 2015 IV Alteplase to match Class III stratifications and reworded for clarity. Class and LOE amended to conform with ACC/AHA 2015 Recommendation Classification System. See Table LXXXIII in online Data Supplement 1 for original wording.

CURRENT STATUS

9/11 experts believe that ADAPT may be used as standard first-line treatment, followed by stent retriever thrombectomy as rescue therapy if needed.

3.7. Mechanical Thrombectomy (Continued)	COR	LO
3. Patients should receive mechanical thrombectomy with a stent retriever if they meet all the following criteria: (1) prestroke mRS score of 0 to 1; (2) causative occlusion of the internal carotid artery or MCA segment 1 (M1); (3) age ≥18 years; (4) NIHSS score of ≥6; (5) ASPECTS of ≥6; and (6) treatment can be initiated (groin puncture) within 6 hours of symptom onset.	I	A
4. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the MCA segment 2 (M2) or MCA segment 3 (M3) portion of the MCAs.		
5. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the anterior cerebral arteries, vertebral arteries, basilar artery, or posterior cerebral arteries.		
6. Although its benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have prestroke mRS score >1, ASPECTS <6, or NIHSS score <6, and causative occlusion of the internal carotid artery (ICA) or proxima MCA (M1). Additional randomized trial data are needed.		
3.7. Mechanical Thrombectomy (Continued)		
7. 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.		
8. In selected patients with AIS within 6 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

New recommendation.

EUROPEAN STROKE JOURNAL

Guidelines

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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)

Table 1. Summary of PICO q

PICO Question	Recommendations	Expert opinion
PICO 1: For adults with LVO-related acute ischaemic stroke within 6 hours of symptom onset, does MT plus BMM compared with BMM alone improve functional outcome ?	In adults with anterior circulation LVO-related acute ischaemic stroke presenting within 6 hours after symptom onset, we recommend MT plus BMM, including IVT whenever indicated, over BMM alone to improve functional outcome. Quality of evidence: High ⊕⊕⊕⊕ Strength of recommendation: Strong ↑↑	There is a consensus among the guideline group (11/11 votes) that patients with M2 occlusion fulfilled the inclusion criteria in most randomized trials and therefore mechanical thrombectomy is reasonable in this situation. There is a consensus among the panel (11/11 votes) that in analogy to anterior circulation LVO and with regard to the grim natural course of basilar artery occlusions, the therapeutic approach with IVT plus MT
PICO 7: For adults with LVO-related acute ischaemic stroke, does selection of MT candidates based on a particular NIHSS score threshold compared with no specific threshold improve functional outcome ?	• We do not recommend an upper NIHSS score limit for decision-making on MT. We recommend that patients with high stroke severity and LVO-related acute ischaemic stroke be treated with MT plus BMM, including IVT whenever indicated. These recommendations also apply for patients in the 6-24h time window, provided that they meet the inclusion criteria for the DAWN* or DEFUSE-3** studies. Quality of evidence: High ⊕⊕⊕⊕, Strength of recommendation: Strong ↑↑. • We recommend that patients with low stroke severity (NIHSS 0-5) and LVO-	In patients with a low NIHSS score (0-5) who are not eligible for a dedicated randomized controlled trial, we suggest that treatment with mechanical thrombectomy in addition to intravenous thrombolysis (or alone in case of contraindication to intravenous thrombolysis) may be reasonable: • in patients with deficits that appear disabling (e.g. significant motor deficit or aphasia or hemianopia) at presentation (vote: 9/11 experts) • in the case of clinical worsening despite intravenous thrombolysis (vote: 9/11 experts)

IV ΘΡΟΜΒΟΛΥΣΗ

ΠΡΕΠΕΙ ΝΑ ΓΙΝΕΤΑΙ I (A-B) EVIDENCE

Σε ασθενείς που έρχονται <3 - 4,5* h

*Ηλικία ≤80 y, χωρίς ιστορικό διαβήτης, προηγούμενου ισχαιμικού ή λήψης αντιπηκτικών από του στόματος, NIHS score ≤25

•ΔΕΝ ΚΑΘΥΣΤΕΡΟΥΜΕ ΓΙΑ ΤΥΧΟΝ ΚΛΙΝΙΚΗ ΒΕΛΤΙΩΣΗ

•ΟΧΙ ΧΟΡΗΓΗΣΗ ΣΕ ΑΣΘΕΝΕΙΣ ΠΟΥ ΕΛΑΒΑΝ ΘΕΡΑΠΕΥΤΙΚΗ ΔΟΣΗ ΧΑΜΗΛΟΥ ΜΟΡΙΑΚΟΥ ΒΑΡΟΥΣ ΗΠΑΡΙΝΗ ΤΟ ΠΡΟΗΓΟΥΜΕΝΟ 24ΩΡΟ

ΜΠΟΡΕΙ ΝΑ ΔΙΚΑΙΟΛΟΓΗΘΕΙ IIb (B) EVIDENCE

Σε ασθενείς που έρχονται 3-4,5* h

ΚΑΙ

Ηλικία ≤80 y, χωρίς ιστορικό διαβήτης, προηγούμενου ισχαιμικού ή λήψης αντιπηκτικών από του στόματος, NIHS score ≤25

ΑΝ

πληρούνται τα λοιπά κριτήρια

CT

ΜΗΧΑΝΙΚΗ ΘΡΟΜΒΕΚΤΟΜΗ

ΠΡΕΠΕΙ ΝΑ ΓΙΝΕΤΑΙ I (A) EVIDENCE

Σε συνδυασμό με/χωρίς IV θρομβόλυση για ασθενείς που έρχονται <4,5 h/6h και απόφραξη μεγάλου αγγείου πρόσθιας κυκλοφορίας (M1-M2 κλάδοι) ή βασικής αρτηρίας, NIHS score>5, ASPECT score>5

CTA

Σε επιλεγμένους ασθενείς που έρχονται >6 h …< 16 h (ισχαιμική-νεκρωτική ανακολουθία)

CTA-CTP

MRP-DW

RAPID software

ΜΠΟΡΕΙ ΝΑ ΔΙΚΑΙΟΛΟΓΗΘΕΙ IIb (B-C) EVIDENCE

Σε συνδυασμό με/χωρίς IV θρομβόλυση για ασθενείς που έρχονται <4,5 h/6h και απόφραξη μικρού αγγείου πρόσθιας κυκλοφορίας ή

οπίσθιας κυκλοφορίας

Ή

Ασθενείς με NIHS score 0-5 και σημαντικό νευρολογικό έλλειμμα ή επιδείνωση νευρολογικής εικόνας παρά την θρομβόλυσης

ASA Policy Statement

Recommendations for the Establishment of Stroke Systems of Care: A 2019 Update

A Policy Statement From the American Stroke Association

Opeolu Adeoye, MD, MS, FAHA, Chair; Karin V. Nyström, RN, MSN, FAHA; Dileep R. Yavagal, MD; Jean Luciano, CRNP; Raul G. Nogueira, MD; Richard D. Zorowitz, MD; Alexander A. Khalessi, MD, MS, FAHA; Cheryl Bushnell, MD, MHS, FAHA; William G. Barsan, MD; Peter Panagos, MD; Mark J. Alberts, MD, FAHA; A. Colby Tiner, MA; Lee H. Schwamm, MD, FAHA; Edward C. Jauch, MD, MS, FAHA

Stroke Ιούλιος 2019

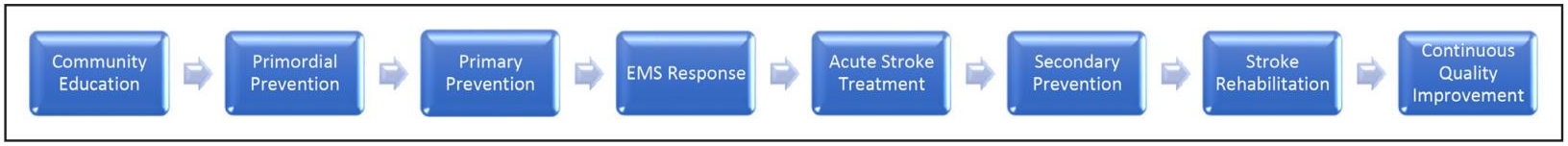


Figure 1. The 8 domains of a stroke system of care. EMS indicates emergency medical services.

Table 1. Levels and Capabilities of Hospital Stroke Designation

	ASRH	PSC	TSC	CSC
Location	Likely rural	Likely urban/suburban	Likely urban	Likely urban
Stroke team accessible/available 24 h/d, 7 d/wk	Yes	Yes	Yes	Yes
Noncontrast CT available 24 h/d, 7 d/wk	Yes	Yes	Yes	Yes
Advanced imaging (CTA/CTP/MRI/MRA/MRP) available 24 h/d, 7 d/wk	No	Yes	Yes	Yes
Intravenous alteplase capable	Yes	Yes	Yes	Yes
Thrombectomy capable	No	Possibly	Yes	Yes
Diagnoses stroke pathogenesis/manage poststroke complications	Unlikely	Yes	Yes	Yes
Admits hemorrhagic stroke	No	Possibly	Possibly	Yes
Clips/coils ruptured aneurysms	No	Possibly	Possibly	Yes
Dedicated stroke unit	No	Yes	Yes	Yes
Dedicated neurocritical care unit/ICU	No	Possibly	Possibly	Yes

ASRH indicates acute stroke-ready hospital; CSC, comprehensive stroke center; CT, computed tomography; CTA, computed tomography angiography; CTP, computed tomography perfusion; ICU, intensive care unit; MRA, magnetic resonance angiography; MRI, magnetic resonance imaging; MRP, magnetic resonance perfusion; PSC, primary stroke center; and TSC, thrombectomy-capable stroke center.

20 YEARS
Cerebrovascular Diseases

Stroke Turns 40

Cerebrovasc Dis 2010;30:127–147
DOI: 10.1159/000315099

Published online: May 24, 2010

Stroke: Working toward a Prioritized World Agenda

Vladimir Hachinski [1] Geoffrey A. Donnan[5, a, h] Philip B. Gorelick[8, b, h] Werner Hacke[30, c, h] Steven C. Cramer [10, d, h] Markku Kaste [33, e, h] Marc Fisher [14, f, h] Michael Brainin [36, g, h] Alastair M. Buchan[37, a] Eng H. Lo[15, a] Brett E. Skolnick[17, a] Karen L. Furie[15, b] Graeme J. Hankey[7, b] Miia Kivipelto[41, b] John Morris[18, b] Peter M. Rothwell[38, b] Ralph L. Sacco[19, b] Sidney C. Smith, Jr.[21, 43, b] Yulun Wang[12, b] Alan Bryer[44, c] Gary A. Ford[39, c] Costantino Iadecola[25, c] Sheila C.O. Martins[45, c] Jeff Saver[13, c] Veronika Skvortsova[46, c] Mark Bayley[3, d] Martin M. Bednar[26, d] Pamela Duncan[22, d] Lori Enney[23, d] Seth Finklestein[16, d] Theresa A. Jones[27, d] Lalit Kalra[40, d] Jeff Kleim[20, d] Ralph Nitkin[28, d] Robert Teasell[2, d] Cornelius Weiller[31, d] Bhupat Desai[11, e] Mark P. Goldberg[18, e] Wolf-Dieter Heiss[32, e] Osmo Saarelma[34, e] Lee H. Schwamm[15, e] Yukito Shinohara[47, e] Bhargava Trivedi[9, e] Nils Wahlgren[41, e] Lawrence K. Wong[48, e] Antoine Hakim[4, f] Bo Norr[illegible] Stephen Prudhomme[29, f] Natan M. Bornstein[49, g] Stephen M. Davis[6, g] Larry B. Gold[illegible] Didier Leys[50, g] Jaakko Tuomilehto[35, g]

In this section, a few successful scenarios from different parts of the world and different medical systems are described to illustrate what can be done to make acute stroke treatment more wi[illegible] ly available depending on the local conditions.

I. The statewide program of stroke unit care and implemen[illegible] tion of thrombolysis in the German State of Baden-Württe[illegible] berg, in which the Ministry of Health, together with[illegible] physicians, has embarked on a statewide program[illegible] stroke management, is described.

II. The strategies for improvement of prehos[illegible] patients with stroke in the United Sta[illegible], a proc[illegible] which was primarily triggered b[illegible]ians.

III. The government-led nation[illegible] medical emerg[illegible] cies, including stroke, w[illegible] started in Brazil is[illegible] viewed.

IV. The example of[illegible] is presented, which shows h[illegible] stroke medi[illegible]ought into rural areas with the l[illegible] of met[illegible]e centers, which themselves are not s[illegible] ila[illegible]and in western Europe or North America[illegible]

V. [illegible] attempts being undertaken in the United King-[illegible]rganizing stroke center care in the metropolitan areas [illegible]also reviewed.

VI. The current efforts being undertaken in the Russian Federation to improve stroke care are also described.

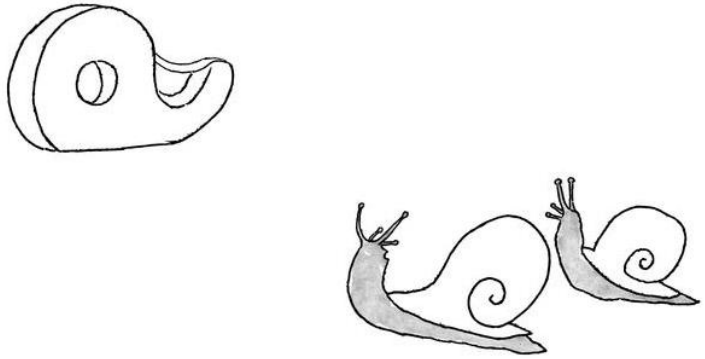
ΚΟΣΤΟΣ ΠΡΟΛΗΨΗΣ << ΚΟΣΤΟΣ ΕΠΙΚΕΙΜΕΝΗΣ ΑΝΑΠΗΡΙΑΣ

✓Ευ[illegible]η του κόσμου για τα συμπτώματα

[illegible]υαισθητοποίηση των μονάδων μεταφοράς

The recent Oxford Vascular study reports that each additional point in the NIHSS score can increase total costs over 5 years by 15%.[43] Therefore, modest improved outcomes are often cost-effective from a societal perspective. These benefits need to be weighed against the procedural risks and the increased risk of symptomatic intracerebral

Οι αυξημένες ανάγκες για ενδαγγειακή θεραπεία ανά τον κόσμο, οδήγησαν κάποιους να προτείνουν την χρησιμοποίηση έμψυχου δυναμικού για την κάλυψη των αναγκών, χωρίς να υπάρχει απαραίτητα προηγούμενη εμπειρία σε τέτοιου είδους επεμβάσεις και χωρίς εν γένει εμπειρία στις αγγειακές νόσους του ΚΝΣ (πχ καρδιολόγοι)



"I don't care if she is a tape dispenser. I love her." S.GROSS

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ELSEVIER

BRITISH ASSOCIATION OF STROKE PHYSICIANS

BRITISH SOCIETY OF NEURORADIOLOGISTS

naccs Neuro-Anaesthesia & Critical Care Society of Great Britain and Ireland

Standards for providing safe acute ischaemic stroke thrombectomy services (September 2015)☆

P.M. White [b], A. Bhalla [a], J. Dinsmore [d], M. James [c], N. McConachie [e], C. Roffe [a], G. Young [c]

Introduction

Stroke is the third leading cause of death and the leading cause of disability in Europe. The management of acute ischaemic stroke is a major healthcare challenge but improving outcomes for acute stroke patients offers major benefits to patients, healthcare systems and society as a whole.

The immediate aim of treatment of acute ischaemic stroke is to recanalise an occluded vessel as quickly, safely and effectively as possible so as to restore reperfusion to the ischaemic brain region. Currently the standard treatment for acute ischaemic stroke for patients presenting up to 4.5 hours after onset is intravenous thrombolysis using tissue plasminogen activator (IVT).[1] This treatment results in a recanalisation rate of only 50% of patients with distal vessel occlusions. However, recanalisation rates of large proximal vessel occlusion are disappointing at 24 hours after IVT treatment, with rates of 14% for internal carotid arteries and 35% for middle cerebral arteries being reported.[2] Over one third of patients with anterior circulatory ischaemic stroke will have large vessel occlusion.

The prognosis for patients with clinically severe stroke secondary to proximal occlusion is poor with the NINDS trial demonstrating that only 10% of patients with an NIHSS score of 20 or more achieved independence at three months.[3] Previous randomised controlled studies reported in 2013 (IMS III, MR RESCUE, SYNTHESIS Expansion) evaluating endovascular approaches in acute ischaemic stroke caused by large vessel occlusive stroke showed no additional benefit to endovascular approaches,[3–5] however despite this in many locations outside the UK these procedures have been incorporated into usual clinical practice.[6,7]

Reasons for the neutral results include use of older, less effective recanalisation devices, longer time window from onset to intervention and the inability to effectively identify patients with large vessel occlusion with appropriate angiographic imaging in a timely fashion. The rationale to deploy endovascular therapies for ischaemic stroke is to potentially improve outcomes by facilitating early recanalisation of an occluded large artery as quickly as possible. Data from the IMS III study confirmed that time window for treatment is a crucial factor and subgroup analysis from this study suggested that improved outcomes (although not statistically significant) were observed in patients who received endovascular therapy within 90 minutes of IVT if thrombolysis treatment was commenced within 2 hours of stroke onset.

☆ These groups are recognised Special Interest Groups of their respective Royal Colleges and the short life working party was operating under the oversight of the Intercollegiate Stroke Working Party.

[a] On Behalf of the British Association of Stroke Physicians.
[b] British Society of Neuroradiologists.
[c] Intercollegiate Stroke Working Party.
[d] Neuroanaesthesia and Neurocritical Care Society of GB & Ireland.
[e] UK Neurointerventional Group.

«Οι επεμβατιστές, δεν θα πρέπει να πραγματοποιούν επεμβάσεις με τις οποίες δεν είναι εξοικειωμένοι και τέτοιες πρακτικές δεν είναι προς το καλό του ασθενούς»

EUROPEAN STROKE JOURNAL

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European recommendations on organisation of interventional care in acute stroke (EROICAS)

Jens Fiehler[1], Christophe Cognard[2], Mauro Gallitelli[3], Olav Jansen[4], Adam Kobayashi[5], Heinrich P Mattle[6], Keith W Muir[7], Mikael Mazighi[8], Karl Schaller[9] and Peter D Schellinger[10]

2. *What operator characteristics are associated with favorable outcome after thrombectomy?*

Well-trained neurointerventionalists are a critical component of an organized and efficient team needed to deliver safe and effective EVT for acute ischemic stroke patients. The great majority of thrombectomies in the five stroke thrombectomy studies showing favorable outcome after EVT were performed by trained, experienced neurointerventionalists, including interventional neuroradiologists, or formally trained endovascular neurosurgeons, and interventional neurologists working routinely on neuroradiological interventional procedures.

Recommendation.

- Thrombectomies should be performed by physicians competent in intracranial endovascular procedures. Competence in Interventional neurovascular procedures is based on:
  - Proven capacity to perform, conduct, and interpret standard diagnostic Neuroradiology (CT, MR, multimodal-imaging) for appropriate case selection.
  - Proven capacity to perform, conduct, and interpret standard intracranial endovascular procedures as well as management skills for procedural complications.
  - Skills in interdisciplinary management of hemorrhagic and ischemic stroke patients with stroke physicians or neurologists/neurosurgeons in stroke centers. Treatment in the context of an acute stroke unit is an option in geographically remote regions.
  - Meeting the minimum requirements for training, certification, caseload, and ongoing education for acute neurovascular procedures by national/European neurointerventional/radiological organizations and national statutory bodies (e.g. certification by a European or National Certificate/Diploma/Master).
  - Continuous updating of the interventional neuroradiology (INR) diagnostic and therapeutic methods and skills.

(Quality of evidence: **Moderate**, Strength of recommendation: **Strong**).

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

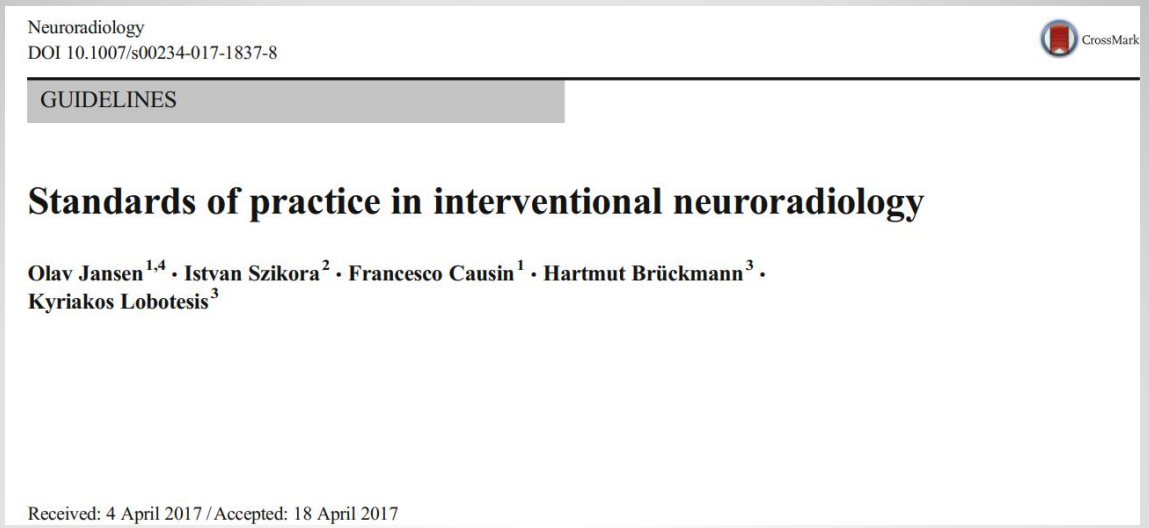
A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

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

Systems of Stroke Care

1. **Patients should be transported rapidly to the closest available certified primary stroke center or comprehensive stroke center or, if no such centers exist, the most appropriate institution that provides emergency stroke care as described in the 2013 guidelines *(Class I; Level of Evidence A)*. In some instances, this may involve air medical transport and hospital bypass.** (Unchanged from the 2013 guideline)
2. **Regional systems of stroke care should be developed. These should consist of the following:**
   a. **Healthcare facilities that provide initial emergency care, including administration of intravenous r-tPA, such as primary stroke centers, comprehensive stroke centers, and other facilities, and**
   b. **Centers capable of performing endovascular stroke treatment with comprehensive periprocedural care, including comprehensive stroke centers and other healthcare facilities, to which rapid transport can be arranged when appropriate *(Class I; Level of Evidence A)*.** (Revised from the 2013 guideline)
3. **It may be useful for primary stroke centers and other healthcare facilities that provide initial emergency care, including administration of intravenous r-tPA, to develop the capability of performing emergency noninvasive intracranial vascular imaging to most appropriately select patients for transfer for endovascular intervention and to reduce the time to endovascular treatment *(Class IIb; Level of Evidence C)*.** (Revised from the 2013 guideline)
4. **Endovascular therapy requires the patient to be at an experienced stroke center with rapid access to cerebral angiography and qualified neurointerventionalists. Systems should be designed, executed, and monitored to emphasize expeditious assessment and treatment. Outcomes for all patients should be tracked. Facilities are encouraged to define criteria that can be used to credential individuals who can perform safe and timely intra-arterial revascularization procedures *(Class I; Level of Evidence C)*.** (Revised from the 2013 guideline)



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GUIDELINES

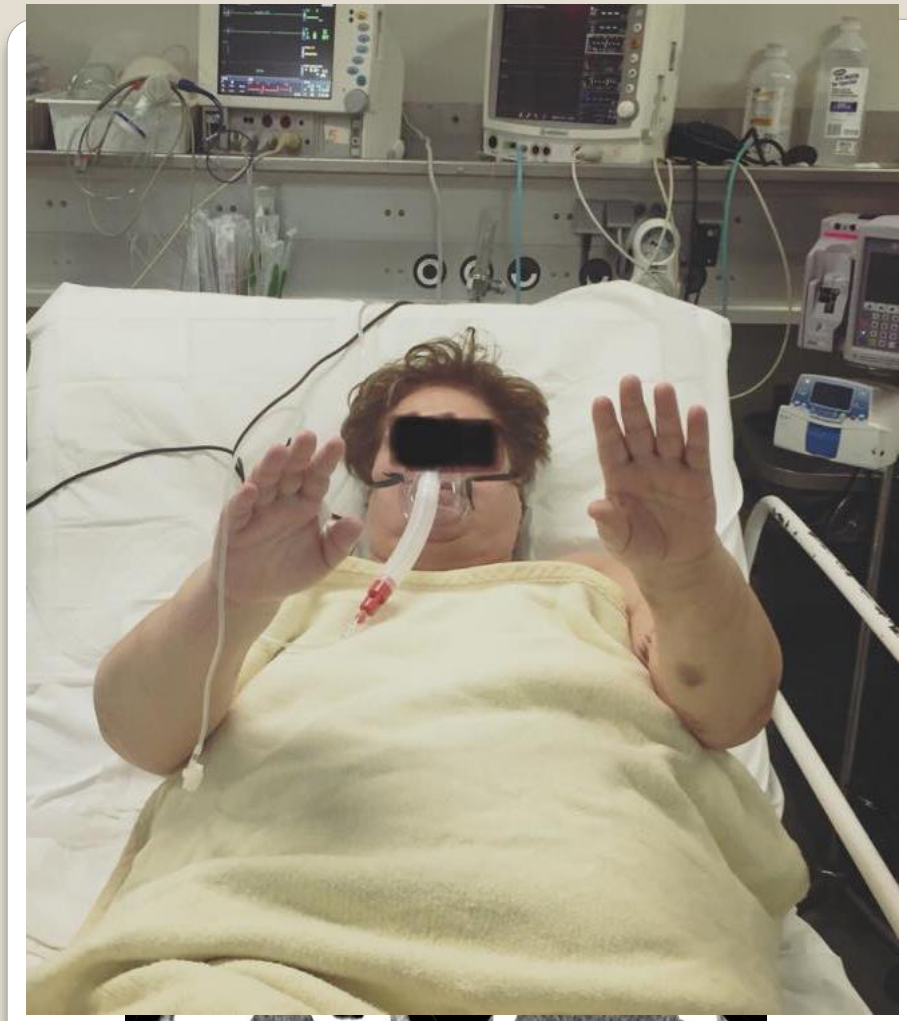
Standards of practice in interventional neuroradiology

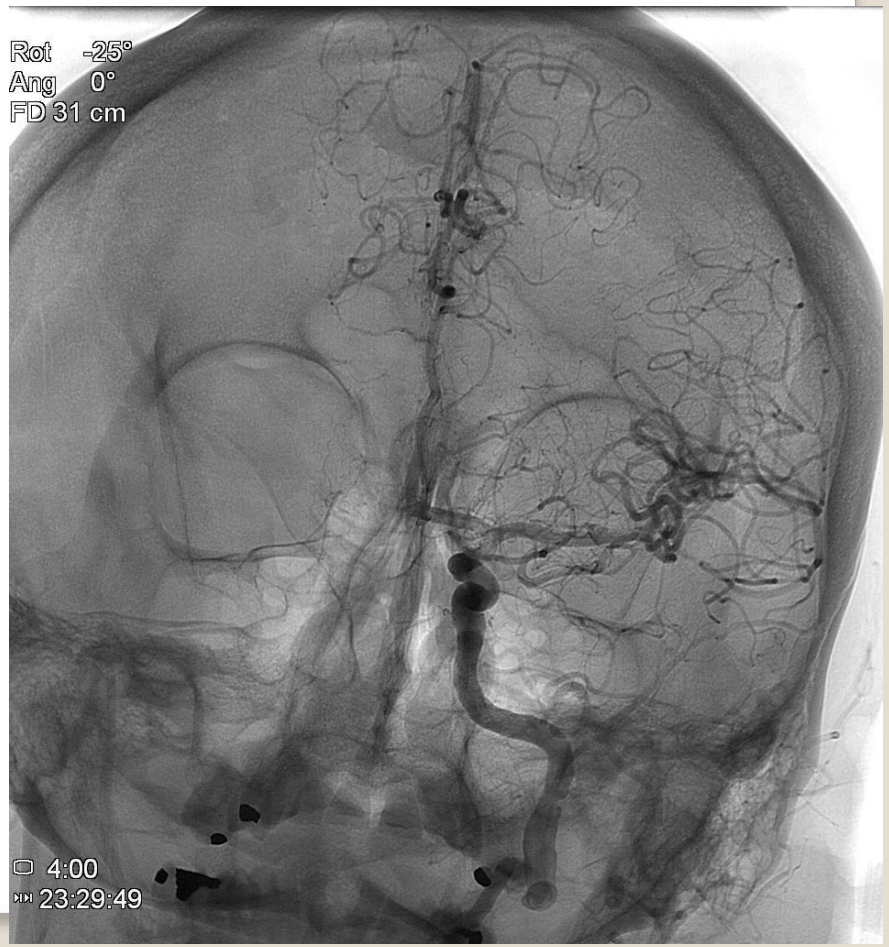
Olav Jansen[1,4] · Istvan Szikora[2] · Francesco Causin[1] · Hartmut Brückmann[3] · Kyriakos Lobotesis[3]

Received: 4 April 2017 / Accepted: 18 April 2017

- Οι νευροπεμβατικές τεχνικές θα πρέπει να εφαρμόζονται σε εξειδικευμένα κέντρα, από Νευρο-επεμβατική ομάδα, με δυνατότητα ανταλλαγής εμπειριών και διαφορετικών τεχνικών (όχι από ένα άτομο)
- Τουλάχιστον 2 (και ιδανικά 4) νευροεπεμβατικοί, ανά κέντρο, με αναισθησιολόγο εξειδικευμένο σε ενδαγγειακές επεμβάσεις ΚΝΣ
- Ανά επέμβαση θα πρέπει να υπάρχουν
  - Επικεφαλής νευρο-επεμβατιστής
  - Αποστειρωμένος βοηθός (νευρο-επεμβατιστής, νοσηλευτής/τρια, τεχνολόγος)
  - Τεχνολόγος
  - Νοσηλευτής/τρια
  - Διαθέσιμος αναισθησιολόγος (αν χρειαστεί)

59 ετών γυναίκα με ιστορικό ΚΜ και πρόσφατης απόξεσης ΔΕ ημιπληγία από 4ώρου
NIHSS score 20
NECT "Υπέρπυκνη ΑΡ μέση εγκεφαλική αρτηρία"





Original research article

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Access to and delivery of acute ischaemic stroke treatments: A survey of national scientific societies and stroke experts in 44 European countries

Diana Aguiar de Sousa*[1], Rascha von Martial*[2], Sònia Abilleira[3], Thomas Gattringer[4], Adam Kobayashi[5], Miquel Gallofré[6], Franz Fazekas[4], Istvan Szikora[7], Valery Feigin[8], Valeria Caso[9] and Urs Fischer[2]; on behalf of the ESO ESMINT EAN SAFE Survey on Stroke Care collaborators†

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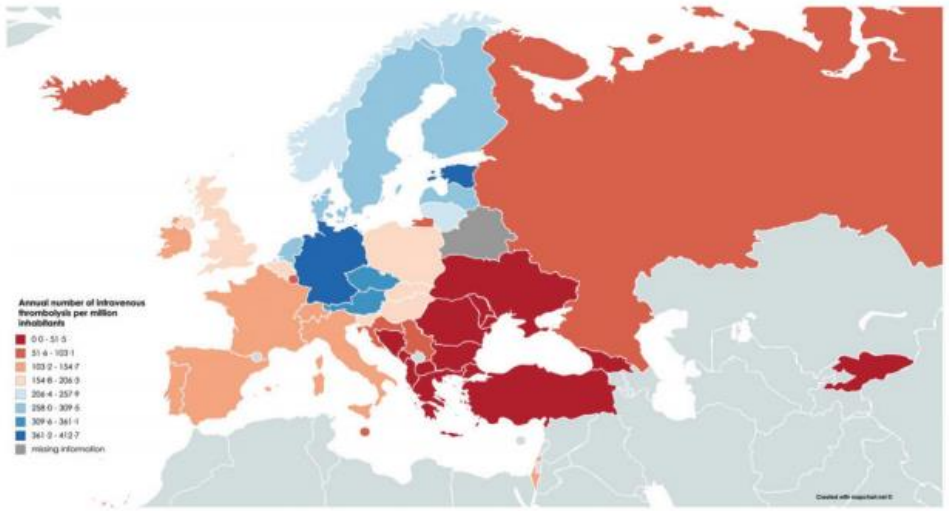

Figure 3. Choropleth map showing contemporary annual rates of intravenous thrombolysis (IVT) per million population in 42 European countries (mean 142.0, 95% CI 107.4–176.7).

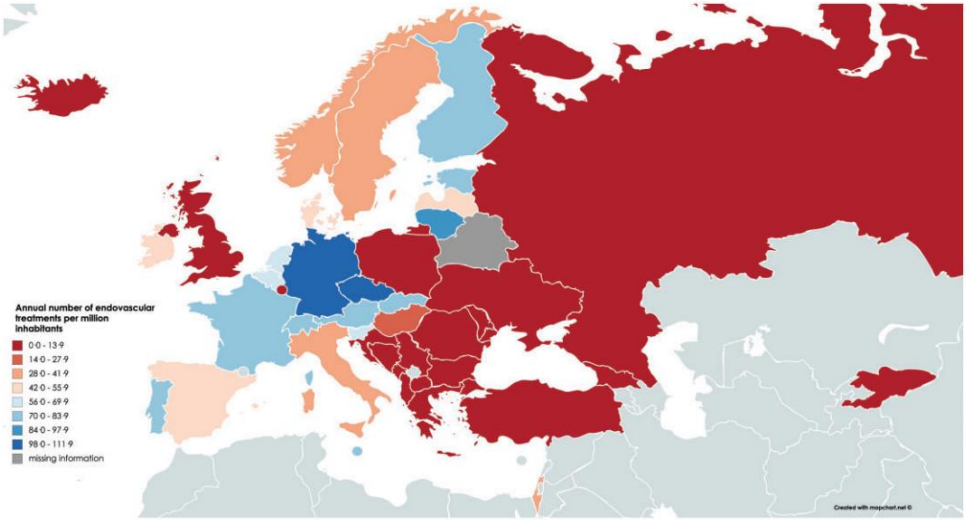

Figure 5. Choropleth map showing contemporary annual rates of endovascular treatments (EVT) for ischaemic stroke per million population in 43 European countries (mean 37.1, 95% CI 26.7–47.5).