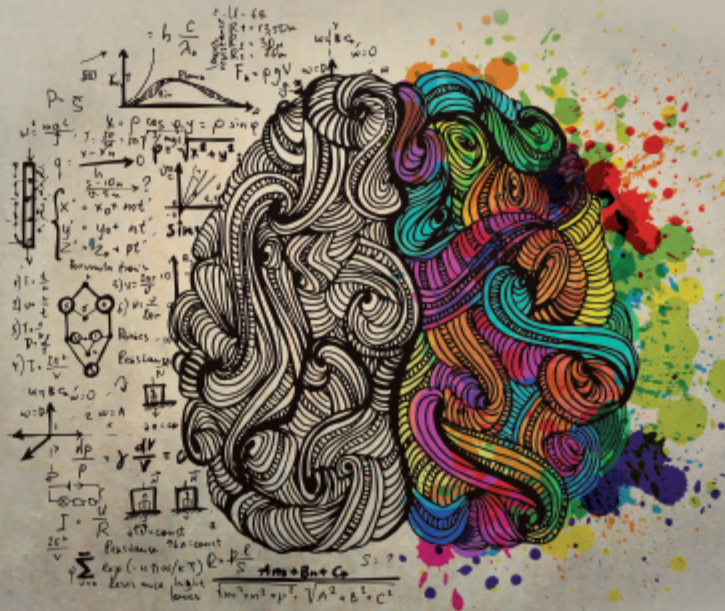


XXVI
CONGRESSO
NAZIONALE



Società Italiana
Interdisciplinare
NeuroVascolare



SINERGIE INTERDISCIPLINARI NEL
PAZIENTE NEUROLOGICO CRITICO

Lecce, 1-2 dicembre 2017

Attualizzazione della trombectomia: certezze e controversie

Cristiano Azzini

Stroke-Unit-U.O. Neurologia

Arcispedale S. Anna Ferrara

Paradigm shift from:

« look for reasons not to thrombolyse »

Reasons to thrombolyse



Paradigm shift to:

« Thrombolyse whenever possible »

Reasons to thrombolyse



Low Rates of Acute Recanalization With Intravenous Recombinant Tissue Plasminogen Activator in Ischemic Stroke

Real-World Experience and a Call for Action

Rohit Bhatia, MD, DM, DNB; Michael D. Hill, MD, FRCPC; Nandavar Shobha, DNB, DM; Bijoy Menon, MD, DM; Simerpreet Bal, MD, DM; Puneet Kochar, MD; Tim Watson, MD, FRCPC; Mayank Goyal, MD, FRCPC; Andrew M. Demchuk, MD, FRCPC

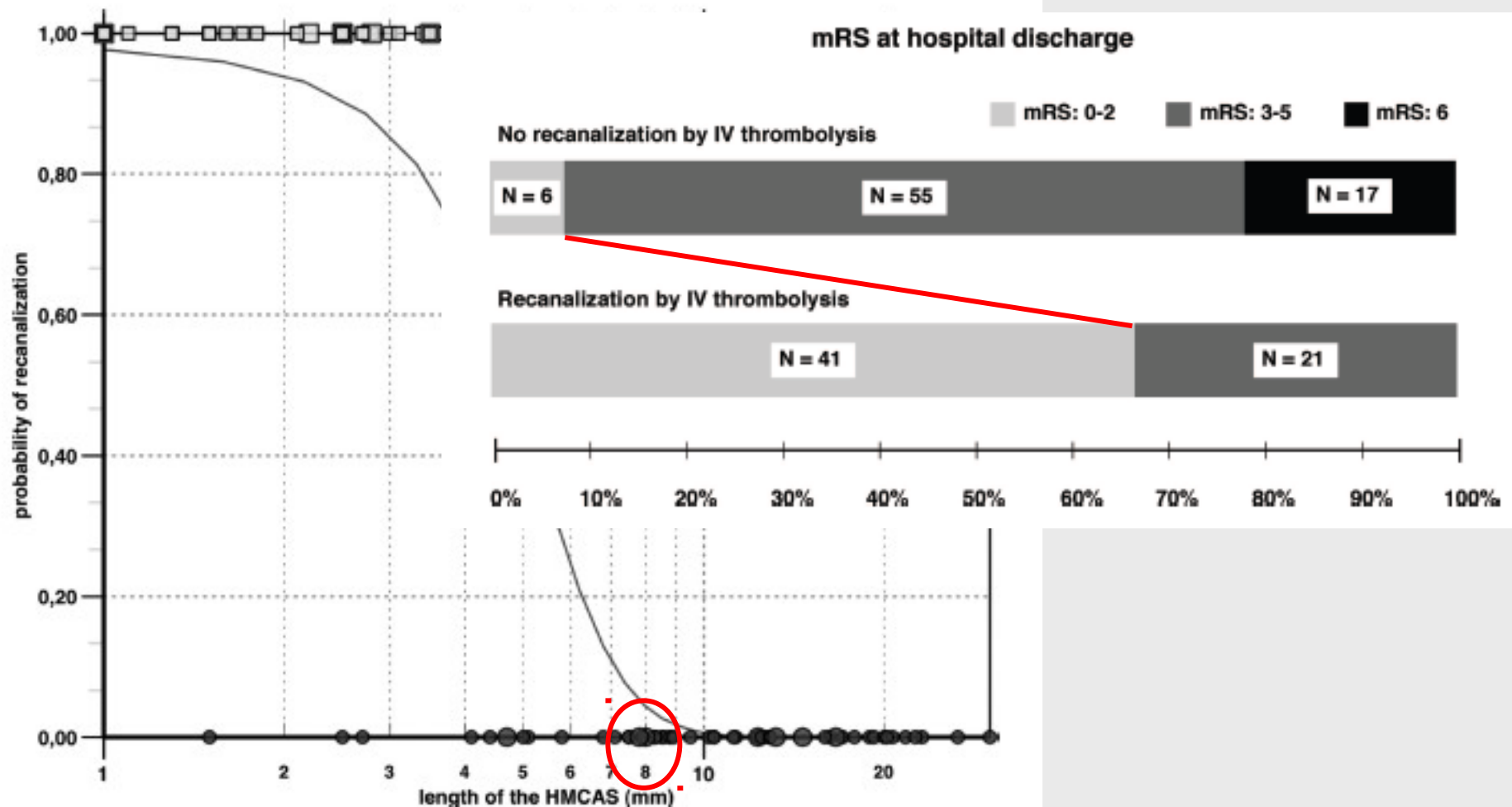
Occlusion Location	Recanalization (All)	Recanalization After IV rt-PA	Recanalization After Endovascular Treatment	No Recanalization
M1-MCA	75.4% (49)	32.3% (21)	43.1% (28)	24.6% (16)
ICA terminus (T, L) occlusion	43.5% (10)	4.4% (1)	39.1% (9)	56.5% (13)
M2-MCA	92.3% (12)	30.8% (4)	61.5% (8)	7.7% (1)
BA	56.0% (14)	4.0% (1)	52.0% (13)	44.0% (11)
All	67.7% (86)	21.3% (27)	46.5% (59)	32.3% (41)

The Importance of Size

(Stroke. 2011;42:1775-1777.)

Successful Recanalization by Intravenous Thrombolysis in Acute Anterior Stroke Depends on Thrombus Length

Christian H. Riedel, MD; Philip Zimmermann, MD; Ulf Jensen-Kondering, MD; Robert Stingele, MD; Günther Deuschl, MD; Olav Jansen, MD



Stroke in corso di **NAO**

Trombolisi ev possibile se:

- ultima assunzione nota e $> 24/48$ h
e

- **dTT** (Dabigatran) o **anti-Xa** (Rivaroxaban, Apixaban) normali
o, se non disponibili

- **aPTT** (Dabigatran) e **PT** (Rivaroxaban, Apixaban) normali

Se possibile, in presenza di occlusione di grossi vasi, preferire
rivascolarizzazione meccanica endovascolare



European Heart Journal
doi:10.1093/eurheartj/ehf134

EHRA Practical Guide on the use of new oral anticoagulants in patients with non-valvular atrial fibrillation: executive summary[†]

Hein Heidbuchel^{1*}, Peter Verhamme¹, Marco Alings², Matthias Antz³, Werner Hacke⁴, Jonas Oldgren⁵, Peter Sinnaeve¹, A. John Camm⁶, and Paulus Kirchhof^{7,8}

In order to maintain catheter stability of the inner diameter the user follow these instructions

Warning! Shaping Man...
the human body.

Warning! Use only a s...
catheter tip. Do not use

Warning! Prior to use...
damage that may hav...
use a catheter that ha...
Damaged catheters n...
trauma or tip detachm...
steering maneuvers.

1. Remove shaping...
distal tip of the cath

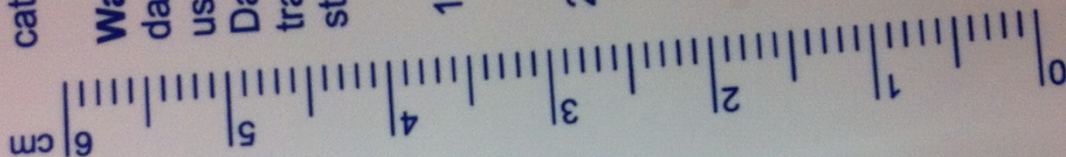
2. Carefully bend c...
desired shape. A...
shape may be r...
catheter relaxat

3. Shape the cath...
approximately...
from the steam...
NOT EXCEED

4. Allow catheter...
saline prior to

5. Remove man...
Multiple shap

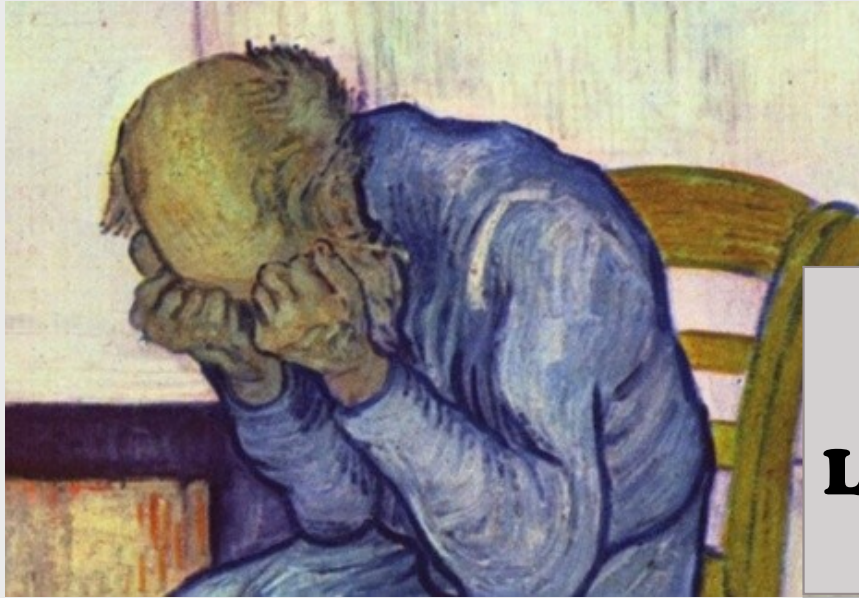
6. Inspect the t...
resulted from...
any damage



30409 Rev10/07

**NECESSARIO PREVEDERE IN ACUTO
L'INDICAZIONE AD UN APPROCCIO
RIPERFUSIVO COMBINATO**

Trials 2013



- SYNTHESIS
- IMS III
- MR RESCUE

**Scarso uso di stentriever
(TICI 2b/3 25%-41%)
Lunghi tempi di ricanalizzazione
No documentata occlusione**

- ✓ Trattamento endoarterioso non superiore a quello trombolitico sistemico
- ✓ Sicuro
- ✓ Penumbra Imaging → non identifica i pazienti candidati alla trombectomia meccanica



**Trombolisi e.v sempre se entro 4.5 h
e non controindicazioni**



MR CLEAN

2015

A Multicenter Randomized CLinical trial
of Endovascular treatment for Acute
ischemic stroke in the Netherlands

CONCLUSIONS

In patients with acute ischemic stroke caused by a proximal intracranial occlusion of the anterior circulation, intraarterial treatment administered within 6 hours after stroke onset was effective and safe. (Funded by the Dutch Heart Foundation and

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812

JANUARY 1, 2015

VOL. 372 NO. 1

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, A.J. Yoo, 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*

ABSTRACT

SWIFT PRIME

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Stent-Retriever Thrombectomy after Intravenous t-PA vs. t-PA Alone in Stroke

CONCLUSIONS

In patients receiving intravenous t-PA for acute ischemic stroke due to occlusions in the proximal anterior intracranial circulation, thrombectomy with a stent retriever within 6 hours after onset improved functional outcomes at 90 days. (Funded by

Hennrich F. Matthe, M.D., Raul G. Nogueira, M.D., Adrian H. Siddiqui, M.D., Ph.D., Dileep R. Yavagal, M.D., Blaise W. Baxter, M.D., Thomas G. Devlin, M.D., Ph.D., Demetrius K. Lopes, M.D., Vivek K. Reddy, M.D., Richard du Mesnil de Rochemont, M.D., Oliver C. Singer, M.D., and Reza Jahan, M.D., for the SWIFT PRIME Investigators*

REVASCAT

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke

CONCLUSIONS

In patients with ischemic stroke with a proximal cerebral arterial occlusion and salvageable tissue on CT perfusion imaging, early thrombectomy with the Solitaire FR stent retriever, as compared with alteplase alone, improved reperfusion, early neurologic recovery, and functional outcome. (Funded by the Australian National Health

for the REVASCAT Trial Investigators*

ESCAPE

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

CONCLUSIONS

Among patients with acute ischemic stroke with a proximal vessel occlusion, a small infarct core, and moderate-to-good collateral circulation, rapid endovascular treatment improved functional outcomes and reduced mortality. (Funded by Covidien and

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*

EXTEND IA

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection

CONCLUSIONS

In patients with acute ischemic stroke caused by a proximal intracranial occlusion of the anterior circulation, intraarterial treatment administered within 6 hours after stroke onset was effective and safe. (Funded by the Dutch Heart Foundation and

L. de Villiers, H. Ma, P.M. Desmond, G.A. Donnan, and S.M. Davis, for the EXTEND-IA Investigators*

1. Tempo

49 (16%) pz arruolati fra le 6 e le 12 ore

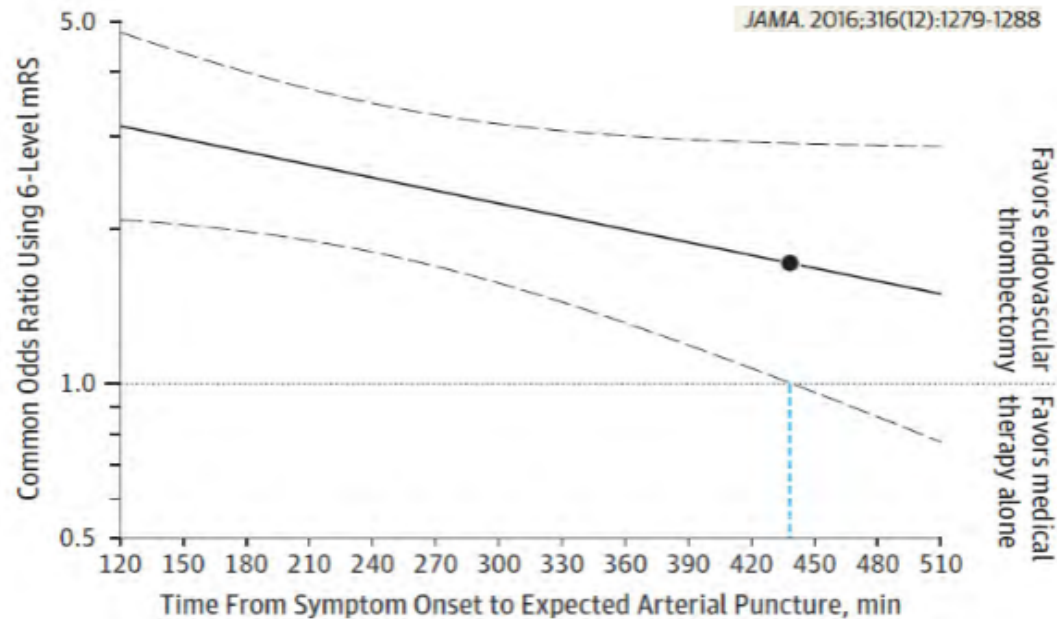
Finestra temporale (onset to goin puncture)		Symptom onset (hours)	
Trial	Source	rt-PA	AIMT
MR CLEAN ³¹	Berkhemer et al, 2015	4.5†	6
ESCAPE ³²	Goyal et al, 2015	4.5†	12
EXTEND-IA ³³	Campbell et al, 2015	4.5	6
SWIFT PRIME ³⁴	Saver et al, 2015	4.5	6
REVASCAT ³⁵	Jovin et al, 2015	4.5†	8
THERAPY ³⁶	Mocco et al, 2015	4.5§	5¶
THRACE ³⁷	Bracard et al, 2015	4	5

22 (21%) pz arruolati fra le 6 e le 8 ore

Time to Treatment With Endovascular Thrombectomy and Outcomes From Ischemic Stroke: A Meta-analysis

Jeffrey L. Saver, MD; Mayank Goyal, MD; Aad van der Lugt, MD; Bijoy K. Menon, MD; Charles B. L. M. Majoie, MD; Diederik W. Dippel, MD;

JAMA. 2016;316(12):1279-1288



LG: EROICAS

Int J Stroke 2016; 11: 701-16

? ***Il tempo dall'inizio dei sintomi all'ago (groin puncture) dovrebbe essere preferibilmente entro le 6 Ore (Qualità dell'evidenza: alta; forza della raccomandazione: forte)***

2. Età

Età

81 pz ≥ 80 anni

Trial	Source	Age (years)
MR CLEAN ³¹	Berkhemer et al, 2015	≥ 18
ESCAPE ³²	Goyal et al, 2015	≥ 18
EXTEND-IA ³³	Campbell et al, 2015	≥ 18
SWIFT PRIME ³⁴	Saver et al, 2015	18-80
REVASCAT ³⁵	Jovin et al, 2015	18-85
THERAPY ³⁶	Mocco et al, 2015	18-85
THRACE ³⁷	Bracard et al, 2015	18-80

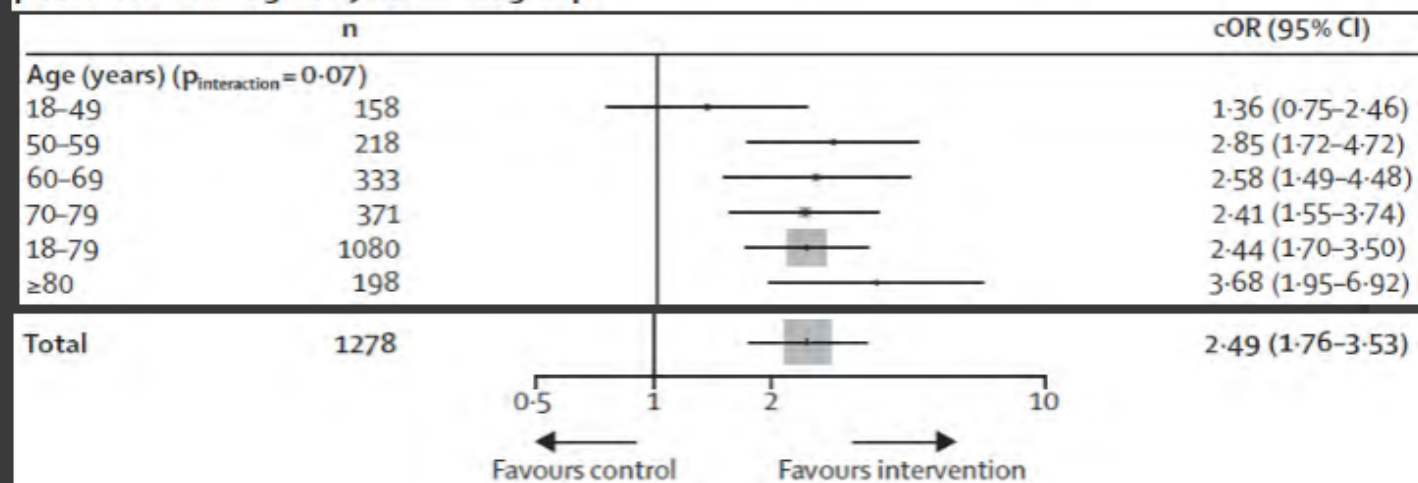
85 pz ≥ 80 anni

?

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

Lancet 2016; 387: 1723-31

Figure 2: Forest plot showing adjusted treatment effect for mRS at 90 days in prespecified subgroups with p values for heterogeneity across subgroups



LG: EROICAS

Int J Stroke 2016; 11: 701-16

? ***Non è giustificato
porre un limite
superiore di età (Qualità
dell'evidenza: alta; forza della
raccomandazione: forte)***

3. Gravità

Entità del deficit

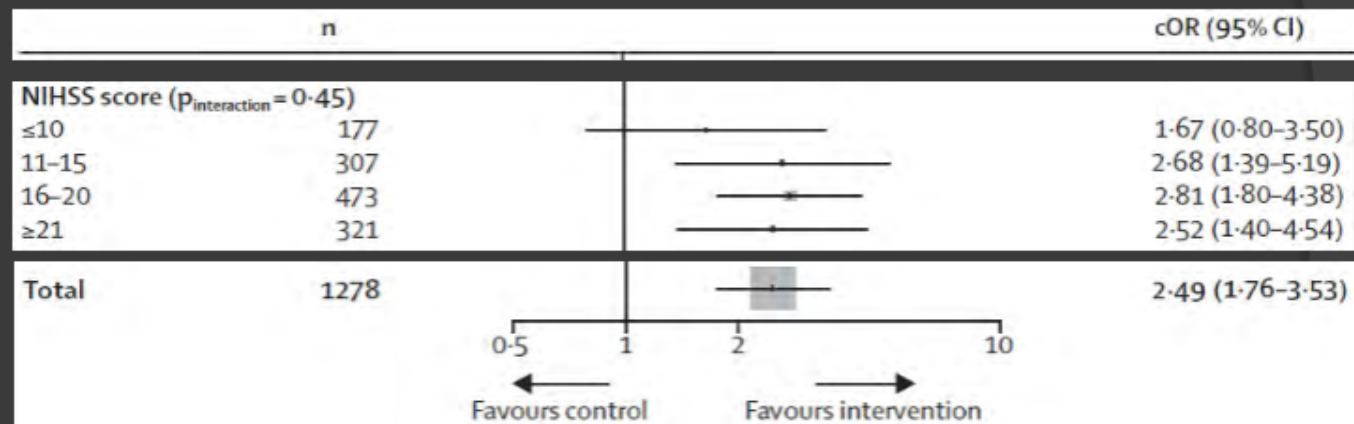
NIHSS medio 15-18

Trial	Source	NIHSS
MR CLEAN ³¹	Berkhemer et al, 2015	≥2
ESCAPE ³²	Goyal et al, 2015	Unrestricted
EXTEND-IA ³³	Campbell et al, 2015	Unrestricted
SWIFT PRIME ³⁴	Saver et al, 2015	8-29
REVASCAT ³⁵	Jovin et al, 2015	≥6
THERAPY ³⁶	Mocco et al, 2015	≥8
THRACE ³⁷	Bracard et al, 2015	10-25

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

Lancet 2016; 387: 1723-31

Figure 2: Forest plot showing adjusted treatment effect for mRS at 90 days in prespecified subgroups with p values for heterogeneity across subgroups

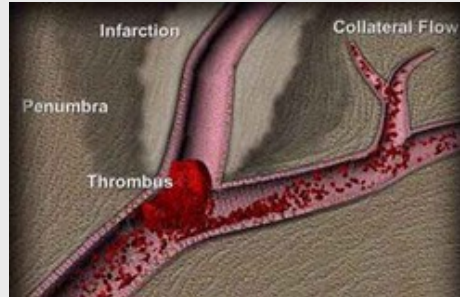
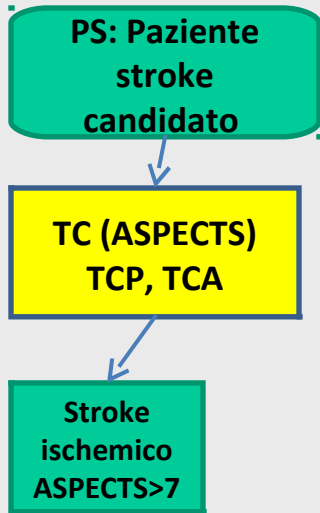


LG: EROICAS

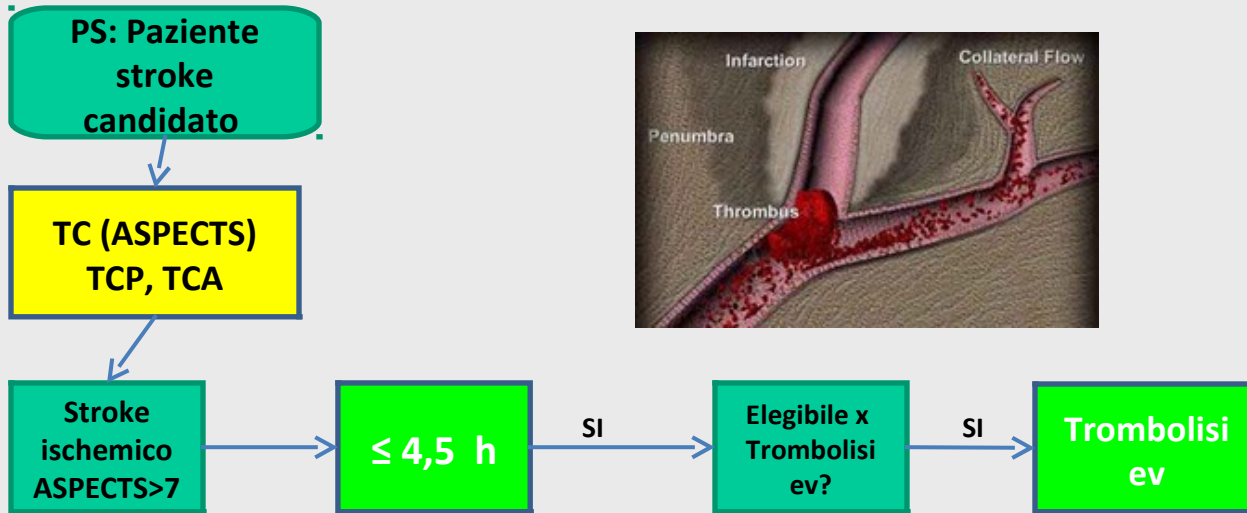
Int J Stroke 2016; 11: 701-16

**❓ *Non è giustificato
porre un limite
superiore o inferiore al
punteggio NIHSS (Qualità
dell'evidenza: moderata; forza
della raccomandazione: forte)***

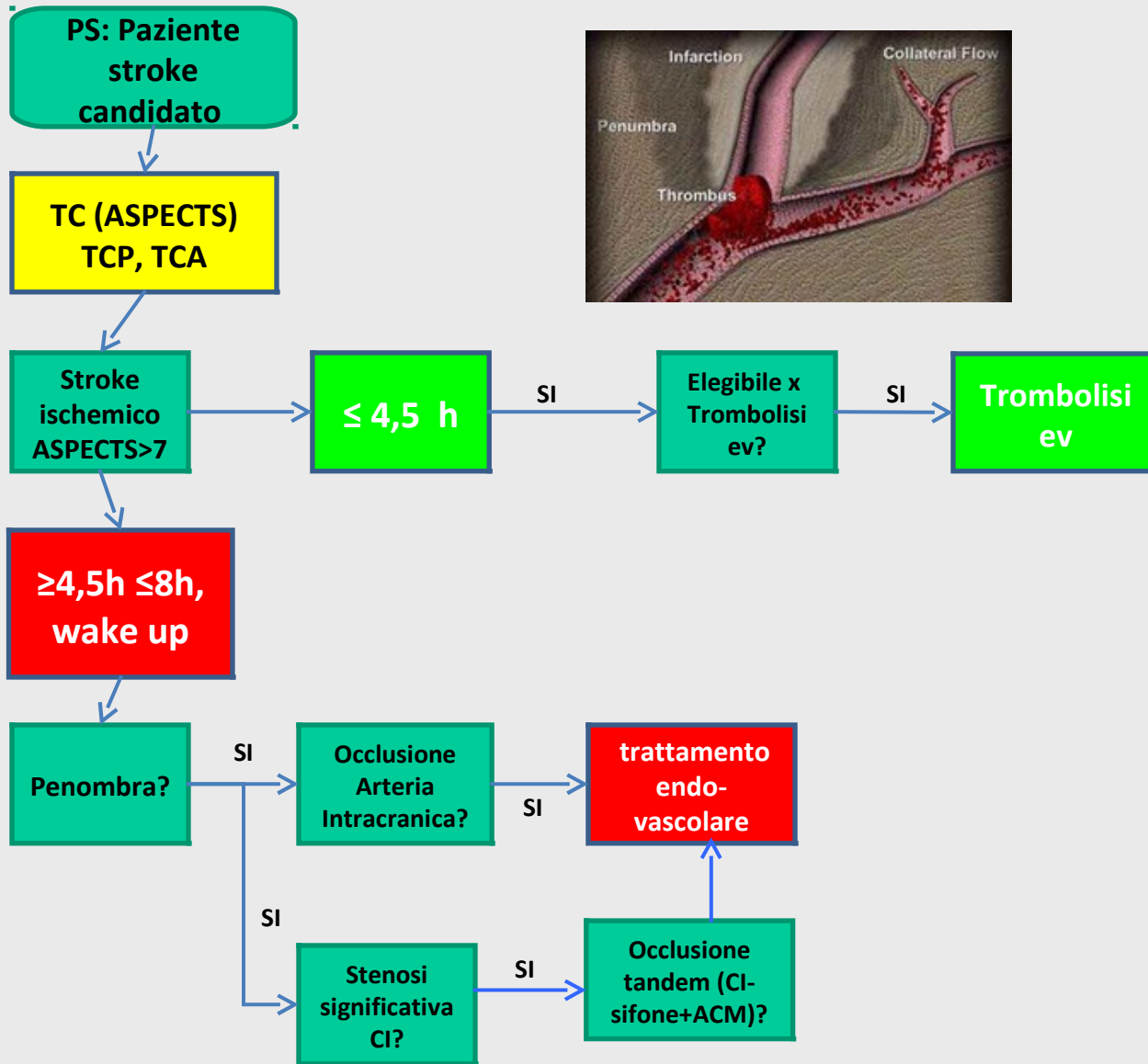
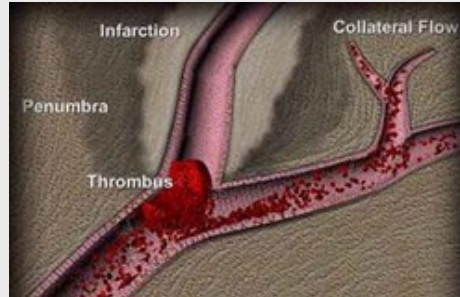
Fase trattamento acuto



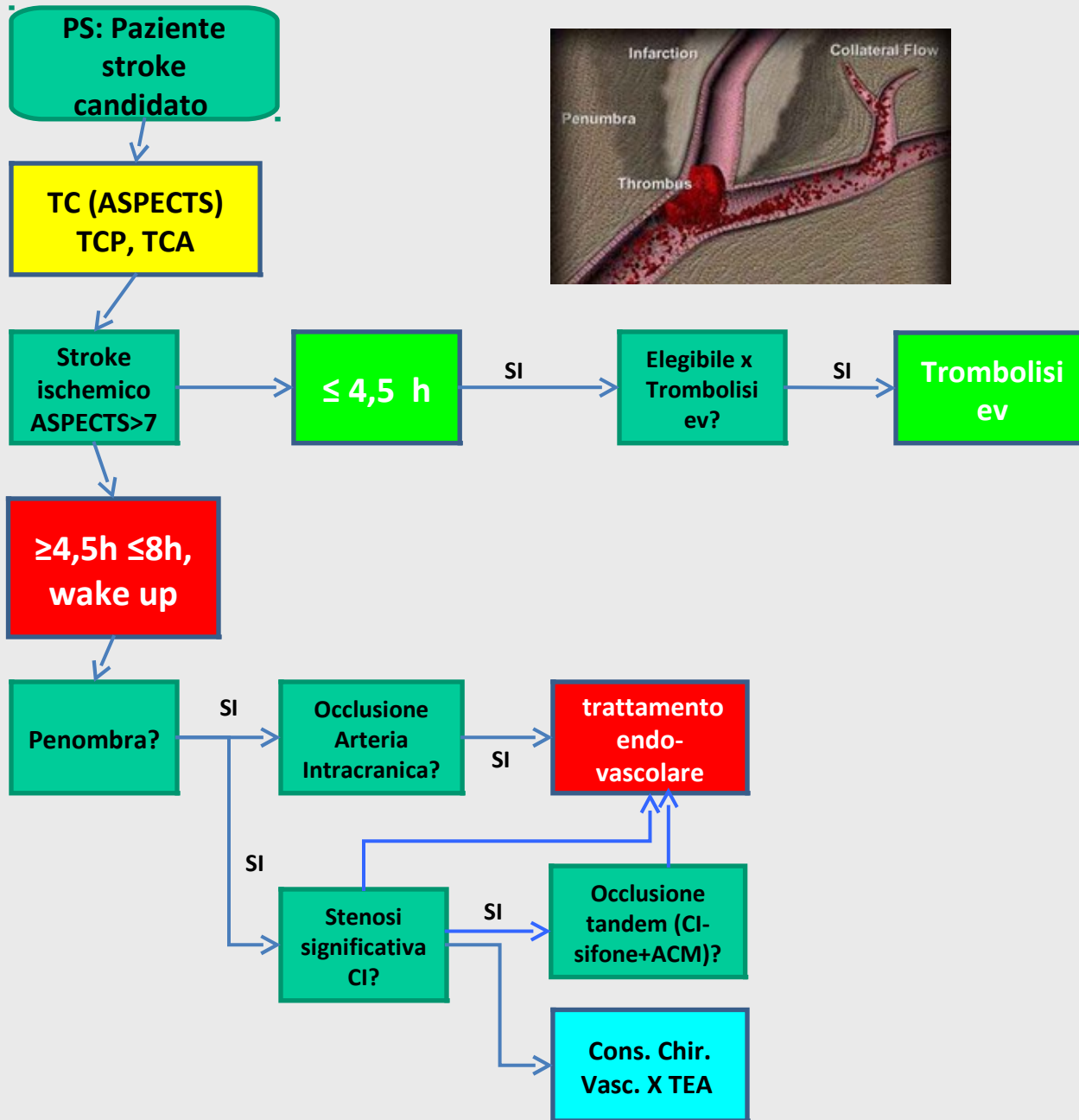
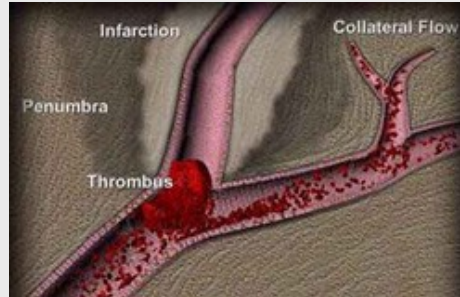
Fase trattamento acuto



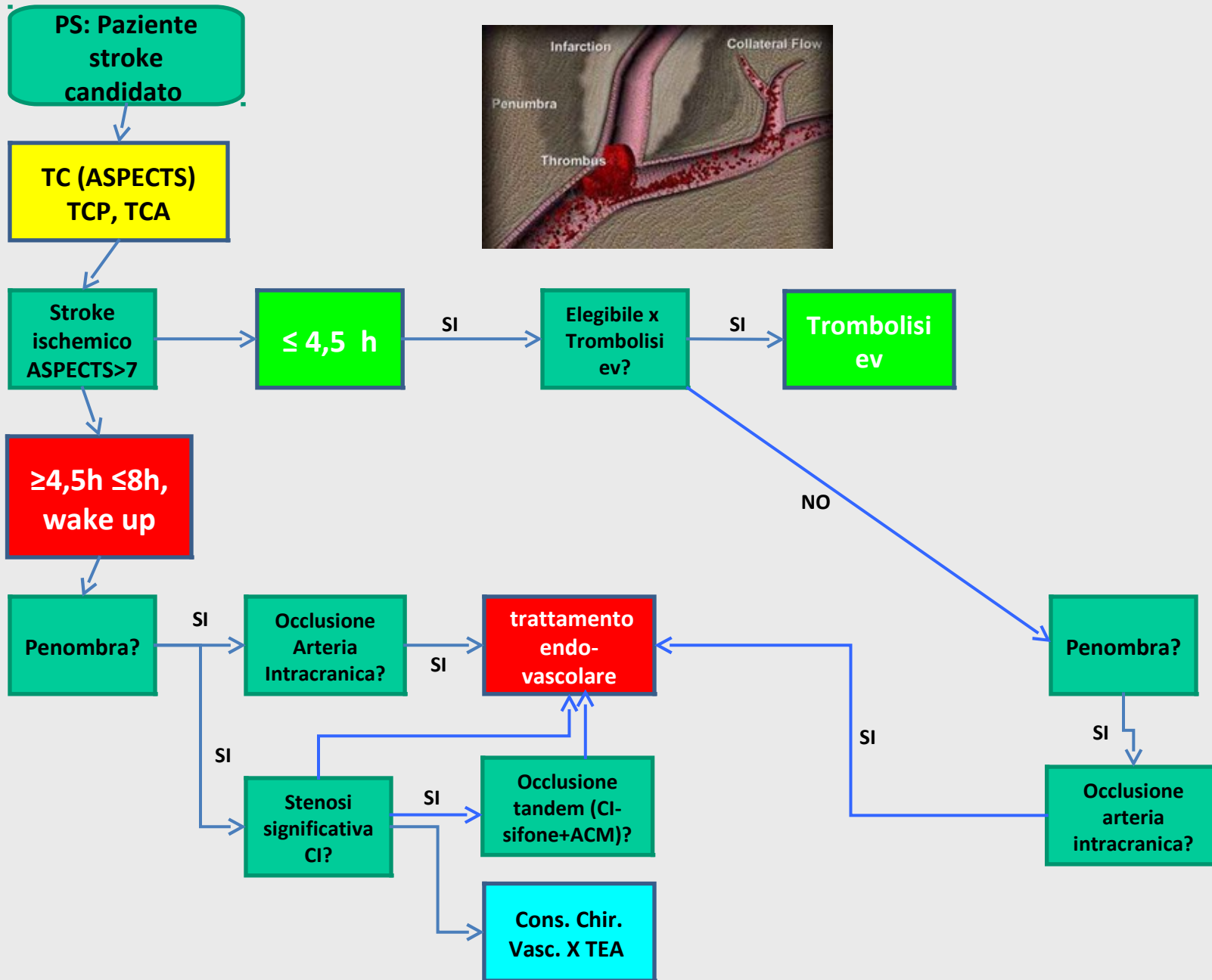
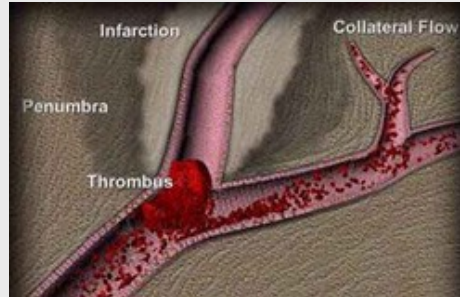
Fase trattamento acuto



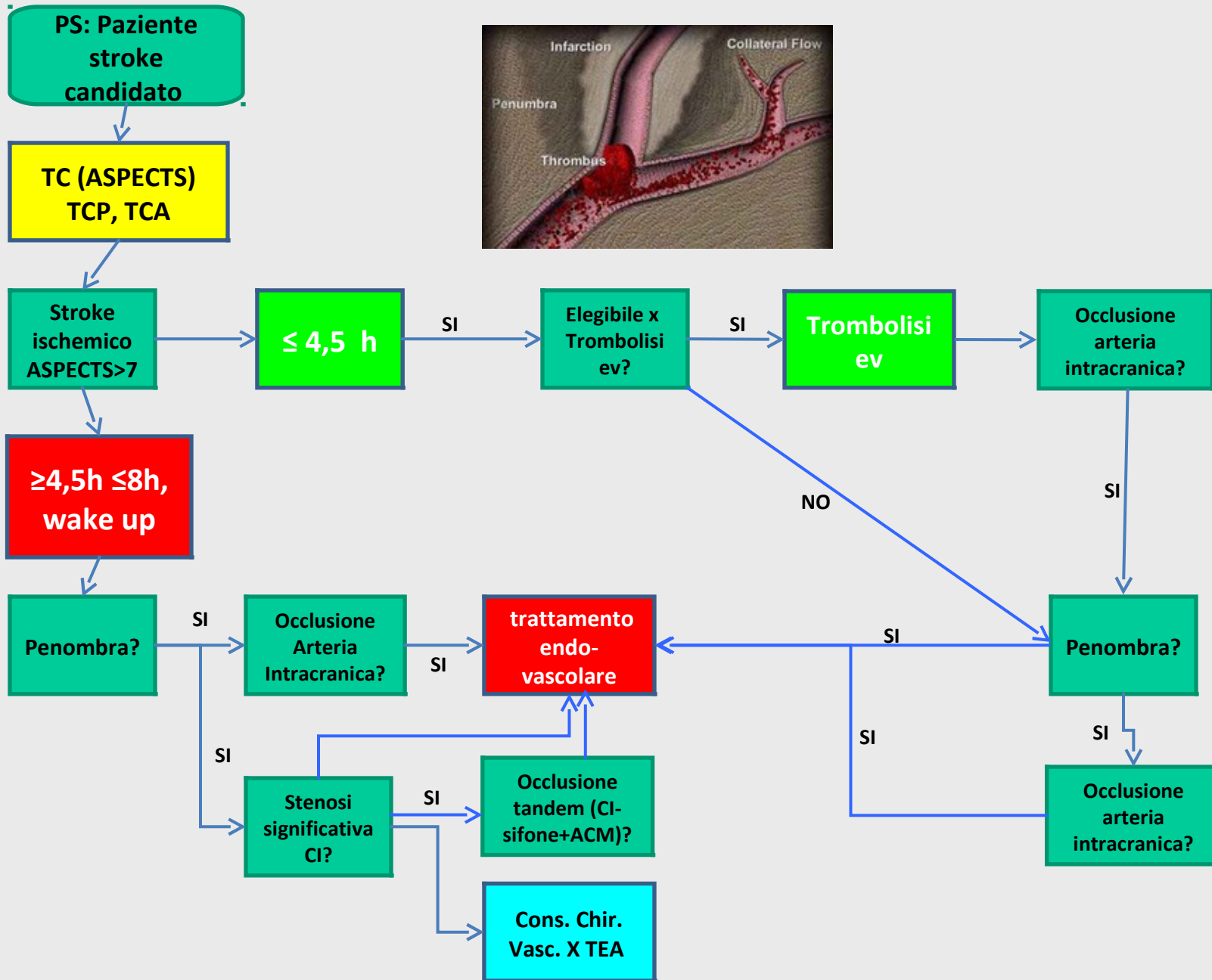
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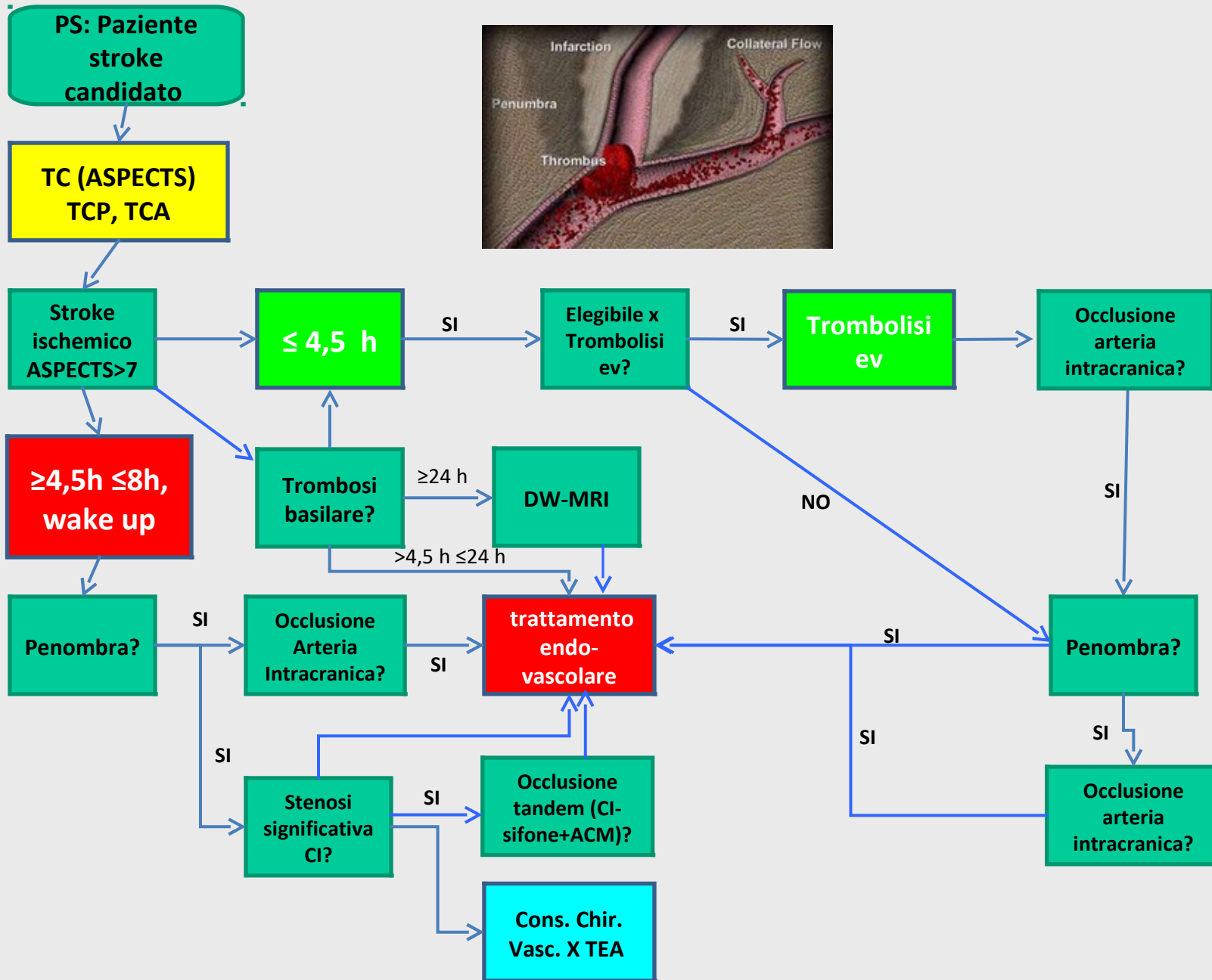
Fase trattamento acuto



Fase trattamento acuto



Fase trattamento acuto



PAZIENTI AZUSL *ROMAGNA* ELEGIBILI PER TRATTAMENTO ENDOVASCOLARE FERRARA

Rilievo di *occlusione di un grosso vaso all'Angio TC* (carotide interna, M1, basilare)

CARATTERISTICHE CLINICHE DEI PAZIENTI ELEGIBILI

- 1. ASPECTS ≥ 7**
- 2. Disabilità lieve pre-ictus** (mRS 0-2)
- 3. Ictus moderato-severo** (NIHSS >6)

SCENARI CLINICI POSSIBILI

1. Pz elegibile a trombolisi ev entro 4,5 h: inizia trombolisi in PS inviante con il Consulente Neurologo e la prosegue in ambulanza (drip and ship)
2. Pz non elegibili a trombolisi ev (insorgenza sintomi oltre 4,5 h o in TAO con INR > 1.7 o altre controindicazioni assolute)
3. Pz con ictus al risveglio previa TC di perfusione (se possibile) o comunque con ASPECTS > 8
4. Pz con occlusione arteria basilare: preferibilmente con esordio ≤ 8 h (da valutare anche se esordio ad orario incerto o oltre 8 h, previa esecuzione di RM per escludere sofferenza ischemica del tronco e paziente molto grave)



Invio a Ferrara entro 6 h dall'esordio dei sintomi (oltre 6 h solo dopo discussione caso neurologo/neuroradiologo Ferrara ed eventuale completamento studio neuroradiologico nell'Ospedale inviante) → **a Ferrara** invio diretto pz in sala TC per TC cerebrale di controllo (emorragia da rTPA, verifica ASPECTS) → TC perfusionale (valutazione penombra) → AGF

Terapia endovascolare con stent retriever se : (nuove raccomandazioni AHA/ASA Class I, level A)

- ✓ pre stroke mRS 0-1
- ✓ r-tPA < 4.5 ore
- ✓ CI o M1 prossimale
- ✓ Età > 18
- ✓ NIHSS ≥ 6
- ✓ ASPECTS ≥ 6
- ✓ puntura entro 6 ore dall'esordio

Stroke 2015, Jun 29, Epub ahead of print

AHA/ASA Guideline

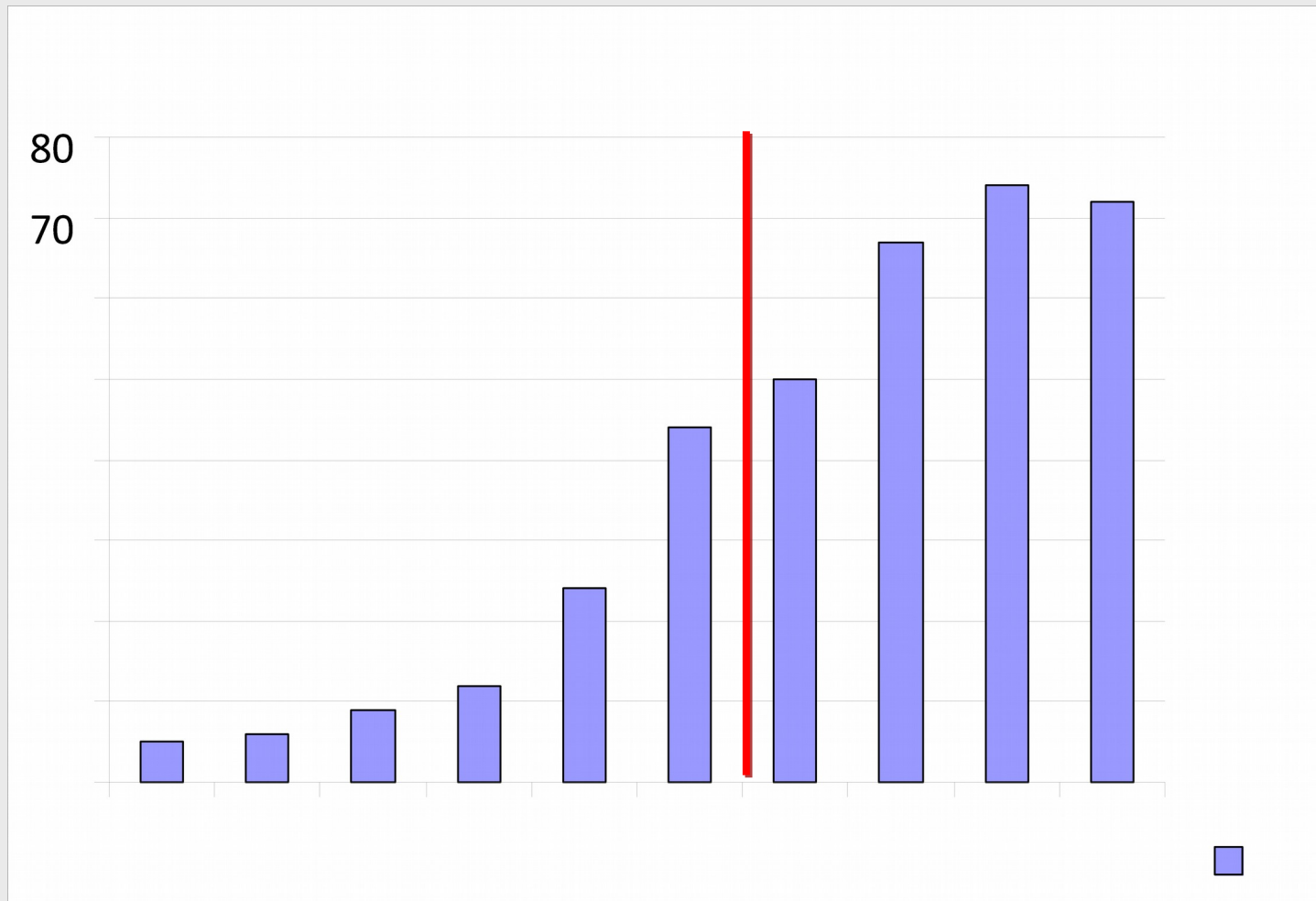
2015 AHA/ASA Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment

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

William J. Powers, MD, FAHA, Chair, Colin P. Derdeyn, MD, FAHA, Vice



Trattamenti endovascolari Ferrara



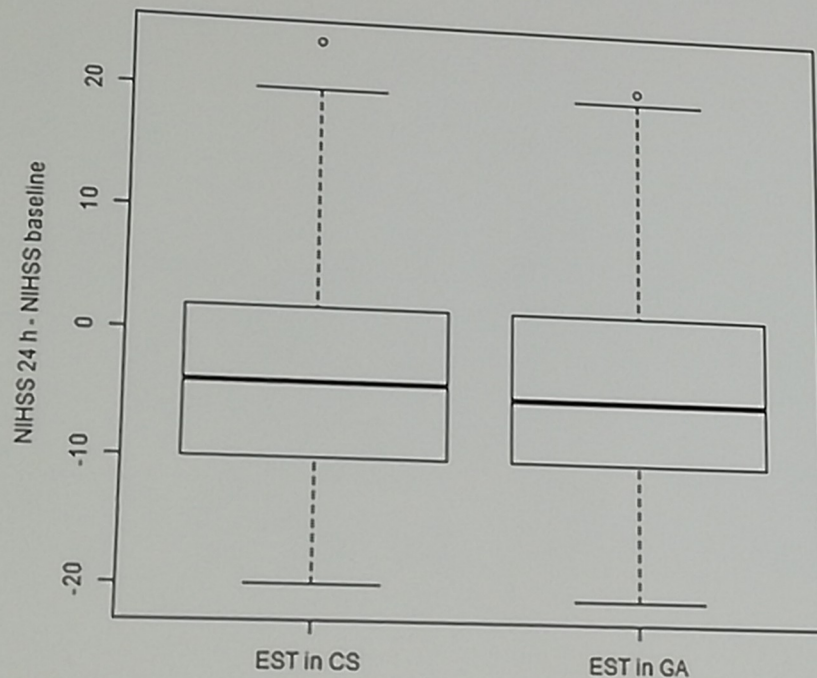
Questioni aperte

- ✓ **Età < 18**
- ✓ **Anestesia generale**
- ✓ **ASPECTS < 6**
- ✓ **Circ. posteriore, M2, A1/A2**
- ✓ **esordio > 6 ore**
- ✓ **Steno/occl. extracranica**
- ✓ **Tecnica (cat.intermedi, cat.pallone)**
- ✓ **mTC, mRM**

Questioni aperte

- ✓ **Età < 18**
- ✓ **Anestesia generale**
- ✓ **ASPECTS < 6**
- ✓ **Circ. posteriore, M2, A1/A2**
- ✓ **esordio > 6 ore**
- ✓ **Steno/occl. extracranica**
- ✓ **Tecnica (cat.intermedi, cat.pallone)**
- ✓ **mTC, mRM**

SIESTA Results – Primary outcome



- No difference in 24h-change of NIHSS
- Mean CS -3.6 vs GA -3.2 ($P = .816$)
- No difference whatsoever in all sensitivity analyses and in conversion cohort

Interventional workflow

Post hoc analysis of the SIESTA trial

Results in patients with M1 occlusions:

- **Higher rate** of complete reperfusion (TICI 3) with **GA**
 - GA: n = 22 (64.7) vs. CS: n = 10 (24.4%) $p < 0.0001$
- Trend towards lower consumption of contrast media with GA

Questioni aperte

- ✓ **Età < 18**
- ✓ **Anestesia generale**
- ✓ **ASPECTS < 6**
- ✓ **Circ. posteriore, M2, A1/A2**
- ✓ **esordio > 6 ore**
- ✓ **Steno/occl. extracranica**
- ✓ **Tecnica (cat.intermedi, cat.pallone)**
- ✓ **mTC, mRM**



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

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*

Table 1. Characteristics of the Patients at Baseline.*

Variable	Thrombectomy Group (N=107)	Control Group (N=99)
Age — yr	69.4±14.1	70.7±13.2
Age ≥80 yr — no. (%)	25 (23)	29 (29)
Male sex — no. (%)	42 (39)	51 (52)
Atrial fibrillation — no. (%)	43 (40)	24 (24)
Diabetes mellitus — no. (%)	26 (24)	31 (31)
Hypertension — no. (%)	83 (78)	75 (76)
Previous ischemic stroke or transient ischemic attack — no. (%)	12 (11)	11 (11)
NIHSS score†		
Median	17	17

Type of stroke onset — no. (%)‡

On awakening	67 (63)	47 (47)
Unwitnessed stroke	29 (27)	38 (38)
Witnessed stroke	11 (10)	14 (14)

Intracranial internal carotid artery	22 (21)	19 (19)
First segment of middle cerebral artery	83 (78)	77 (78)
Second segment of middle cerebral artery	2 (2)	3 (3)
Interval between time that patient was last known to be well and randomization — hr		
Median	12.2	13.3
Interquartile range	10.2–16.3	9.4–15.8
Range	6.1–23.5	6.5–23.9
Time from first observation of symptoms to randomization — hr		
Median	4.8	5.6
Interquartile range	3.6–6.2	3.6–7.8

344 pazienti prospettici (2011-2015) con Stroke al risveglio e occlusione di circolo anteriore **FERRARA-MODENA**

	Entro 6 ore N=283	Risveglio N=61	p
Età, mediana (iqr)	73 (65-79)	70 (62-78)	0.252
Sesso M, N(%)			
NIHSS basale, mediana (iqr)	18 (13-22)	18 (11-23)	0.992
Sede occlusione, N (%)			0.578
Sifone T	59 (20.8)	7 (11.5)	
M1	121 (42.8)	38 (62.3)	
M2	46 (16.3)	8 (13.1)	
Tandem	57 (20.1)	8 (13.1)	
Latenza esordio-TC, mediana minuti (iqr)	109 (64-236)	117 (60-285)	0.881
Latenza TC-inizio procedura, mediana minuti	240 (185-390)	215 (166-470)	0.602
Latenza TC-fine procedura, mediana minuti	350 (280-520)	350 (250-569)	0.546
Mismatch presente, N (%)	225 (97.0)	54 (96.4)	0.550
Ricanalizzazione TICI 2b-3, N (%)	213 (76.1)	49 (80.3)	0.297
Complicanze Esa/dissezione, N (%)	21 (7.4)	1 (1.6)	0.072
Emorragia intracranica sintomatica 24h, N (%)	28 (9.9)	0 (0.0)	0.003
Outcome funzionale mRS 0-2, N (%)	119 (42.8)	29 (48.3)	0.261
Morte, N (%)	58 (20.9)	5 (8.3)	0.014

356 pz (2011-2015) ictus > 6 ore con occlusione di circolo anteriore

FERRARA-MODENA

	≤6h N=250	>6h N=106	P
Età, mediana (iqr)	73 (65-79)	72 (62-78)	0.409
Sesso M, N(%)	118 (47.2)	54 (50.9)	0.298
NIHSS basale, mediana (iqr)	19 (13-23)	16 (11-21)	0.002
Sede occlusione, N (%)			
Sifone T	52 (20.8)	16 (15.1)	0.289
M1	113 (45.2)	50 (47.2)	
M2	38 (15.2)	17 (16.0)	
Tandem	47 (18.8)	23 (21.7)	
Latenza esordio-TC, mediana minuti (iqr)	108 (75-149)	410 (276-720)	<0.001
Latenza TC-agf, mediana minuti (iqr)	84 (48-125)	97 (50-221)	0.023
Latenza TC-inizio procedura, mediana minuti (iqr)	95 (62-138)	116 (66-228)	0.002
Latenza TC-fine procedura, mediana minuti (iqr)	193 (150-246)	237 (150-361)	0.001
Mismatch presente, N (%)	209 (96.8)	80 (97.6)	0.529
Ricanalizzazione TICI 2b-3, N (%)	198 (79.2)	76 (73.8)	0.166
Complicanze Esa/dissezione, N (%)	14 (5.6)	8 (7.5)	0.316
Emorragia intracranica sintomatica 24h, N (%)	23 (9.2)	5 (4.8)	0.112
Outcome funzionale mRS 0-2, N (%)	114 (46.5)	33 (35.1)	0.037
Morte, N (%)	43 (17.6)	21 (22.3)	0.196

GRAZIE DELL'ATTENZIONE