

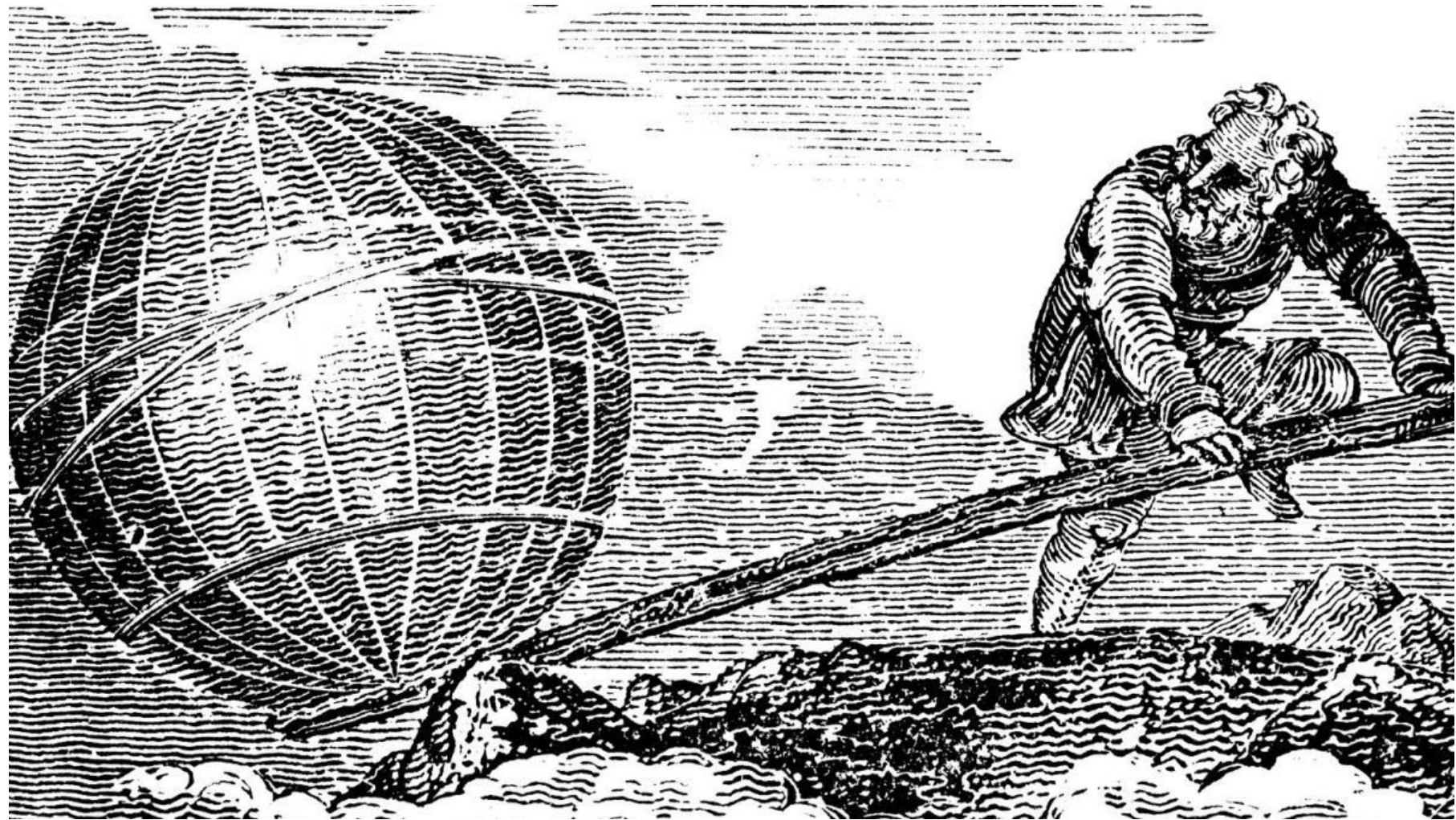
„Actualités dans les maladies cérébro-vasculaires

Urs Fischer
Neurologie





Unanswered Questions



Disclosures



ELAN
EARLY LATE



TECNO

SWIFT-DIRECT



FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION



Swiss Heart
Foundation

Fighting against Heart Disease and Stroke

Medtronic
Further, Together

What do these people have in common?



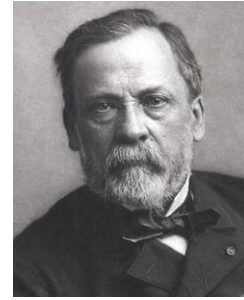
Edward
III.



Georg Friedrich Händel



Alexander von Humboldt



Louis Pasteur



Friedrich Nietzsche



Gustav Stresemann



Richard Nixon



Margaret Thatcher

Chirac hospitalisé pour un accident vasculaire

À 72 ans, Jacques Chirac a été victime d'un « petit accident vasculaire », qui a nécessité son hospitalisation au Val-de-Grâce, pour une semaine. Dominique de Villepin assure l'intérim.

Bangen um Israels Regierungschef

Scharon ringt mit dem Tod

Israel und die westliche Welt haben am Donnerstag um Ariel Scharon gebangt: Ärzte kämpften um das Leben des israelischen Regierungschefs, nachdem dieser am Vorabend einen schweren Schlaganfall erlitten hatte.



Ariel Scharon

Beobachter hielten eine Rückkehr des 77-Jährigen auf die politische Bühne für unwahrscheinlich. Interims-Regierungschef Ehud Olmert versuchte Zweifel über die Zu-



Hillary Clinton leaves hospital after blood clot treatment

US secretary of state was forced to cancel trips to north Africa and Middle East, but is expected to make full recovery



▲ Hillary Clinton leaves hospital with her daughter Chelsea and husband Bill after being treated for a blood clot in her head. Photograph: Joshua Lott/Reuters

Basler Zeitung

SPORT

Basel Schweiz Ausland Wirtschaft Börse Sport Kultur Panorama Fussball Super League Tennis Motorsport Wintersport Hockey Weitere Sportarten Steilpass Tabell

Antonio Cassano erlitt Schlaganfall

Aktualisiert am 01.11.2011

Der Stürmer wurde mit Sprach-, Seh- und Gleichgewichtsstörungen ins Spital eingeliefert und steht Milan wohl längere Zeit nicht zur Verfügung.



Laut Diagnose erlitt er einen Schlaganfall: Antonio Cassano. Bild: Keystone

Est-ce un AVC/AIT ? Nouvelle campagne Suisse



SHG - Schweizerische Hirnschlaggesellschaft
SCS - Société Cérébrovasculaire Suisse
SCS - Società Cerebrovascolare Svizzera
SSS - Swiss Stroke Society
neurovasc.ch

www.attaqucerebrale.ch



Fondation Suisse
de Cardiologie

Est-ce un AVC/AIT ?

Apparition soudaine ou au réveil de ...

Signes fréquents :



Paralysie
au visage



Paralysie dans les
bras ou les jambes



Troubles de
la parole

Signes moins fréquents :



Troubles
de la vue



Vertiges
violents



Maux de tête
intenses

→ 144

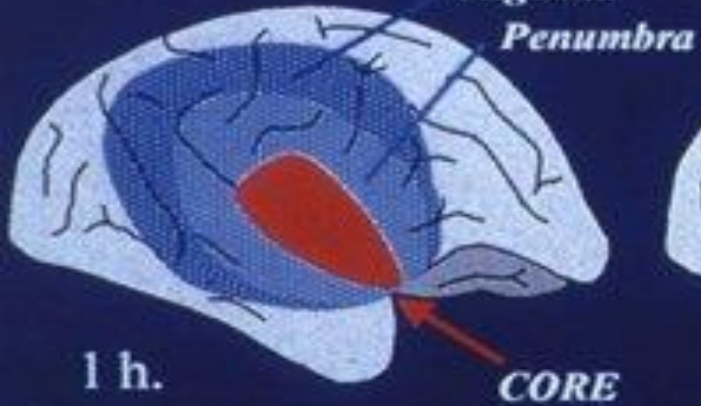
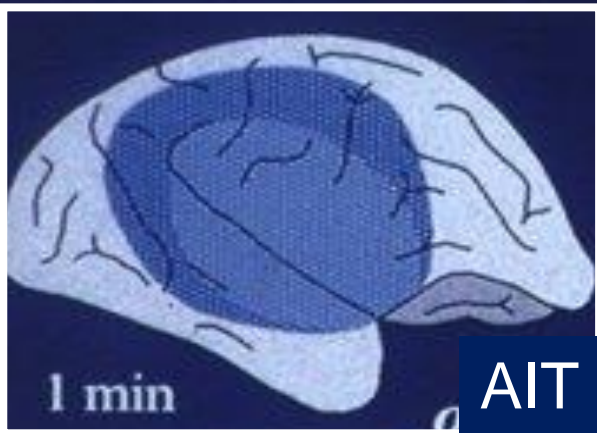


SHG - Schweizerische Hirnschlaggesellschaft
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SCS - Società Cerebrovascolare Svizzera
SSS - Swiss Stroke Society
neurovasc.ch



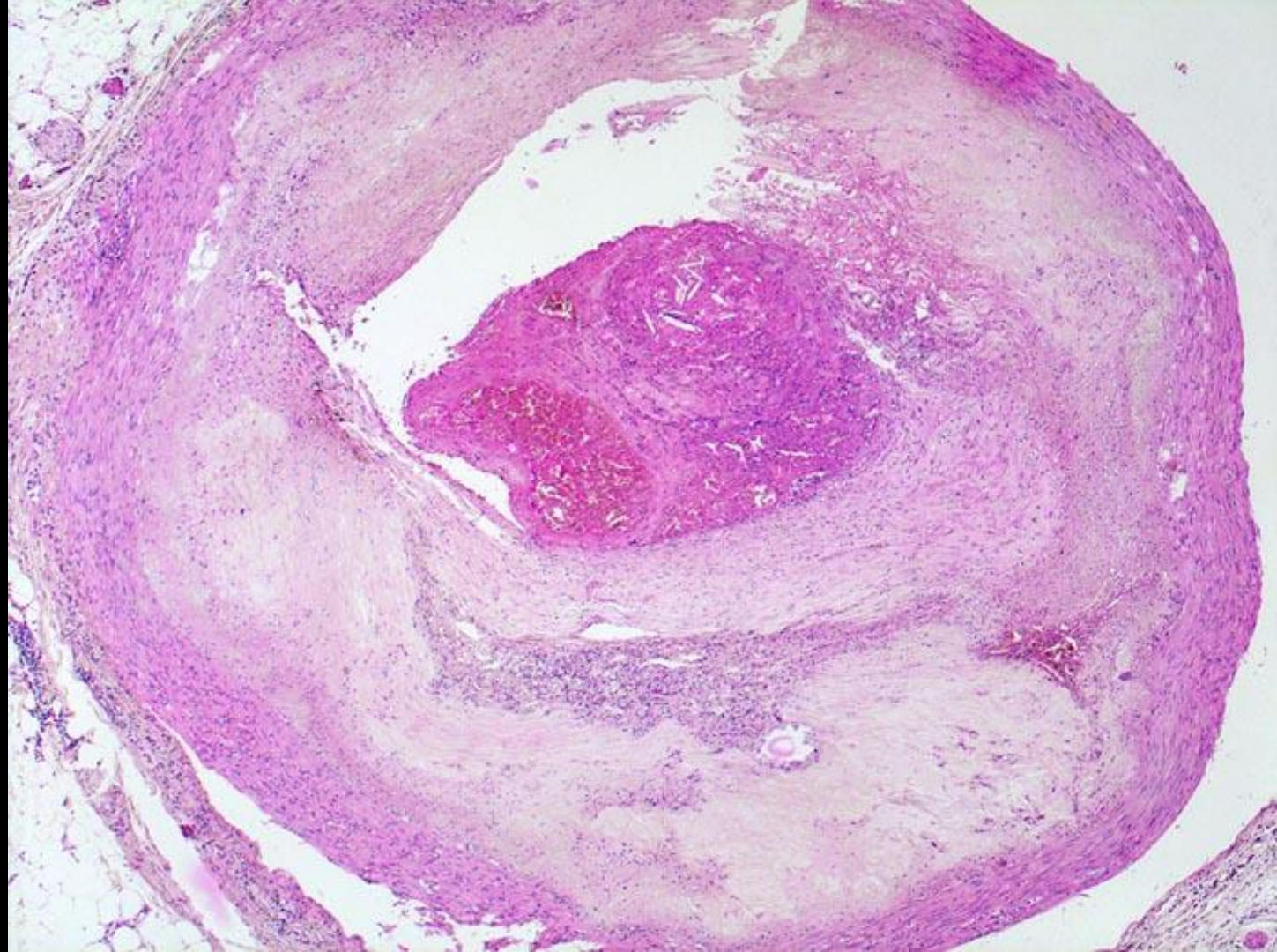
Fondation Suisse
de Cardiologie

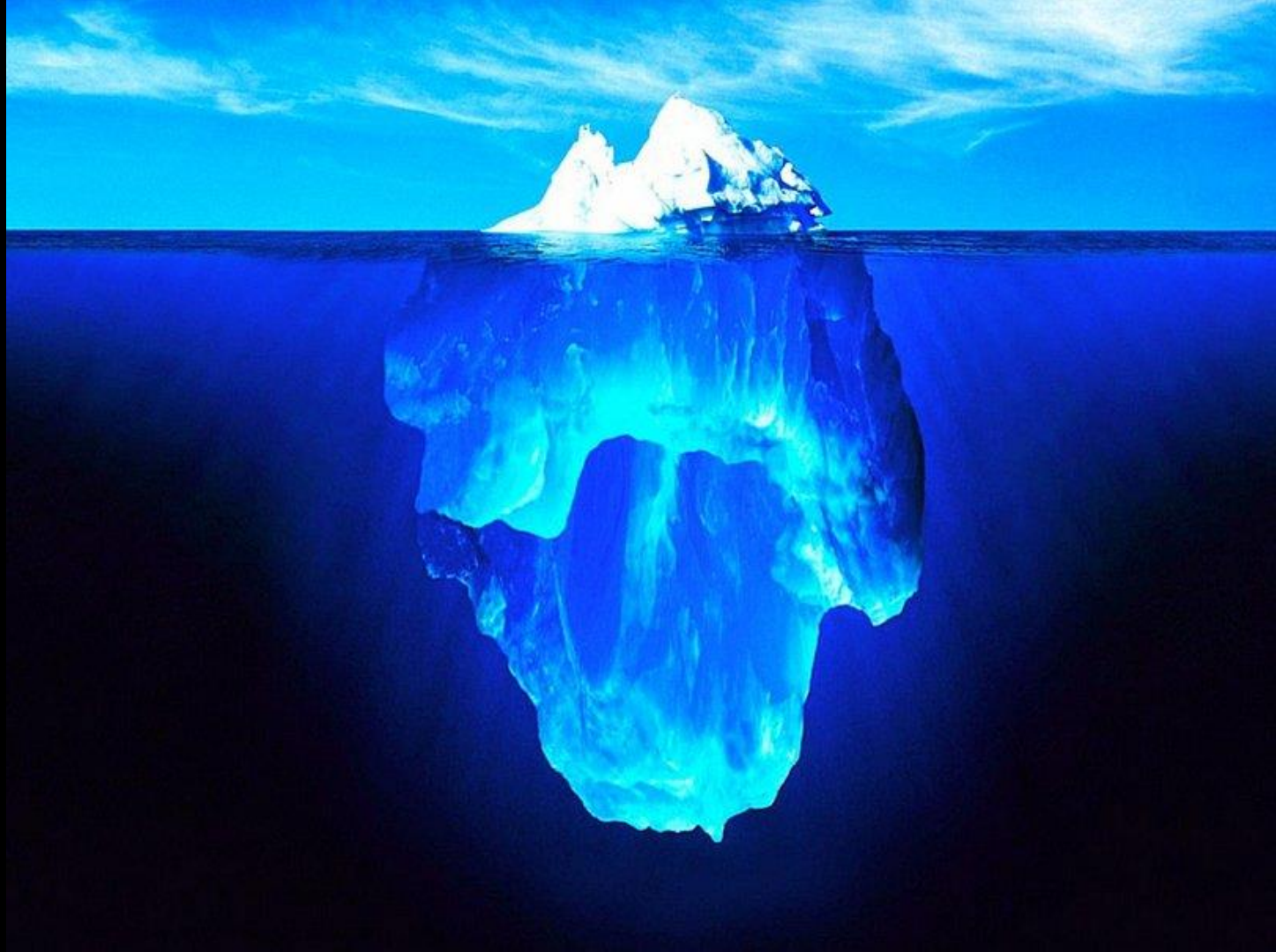
Campagne Suisse contre l'AVC
Clip sur: www.attaqucerebrale.ch (avi)



The Ischemic Penumbra : A Dynamic [time + space] concept

Aetiology?





20%

Small
vessel
disease

Intracranielle
Atheromatosis

20%

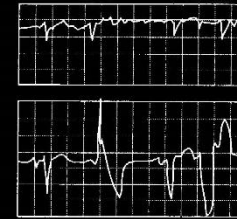
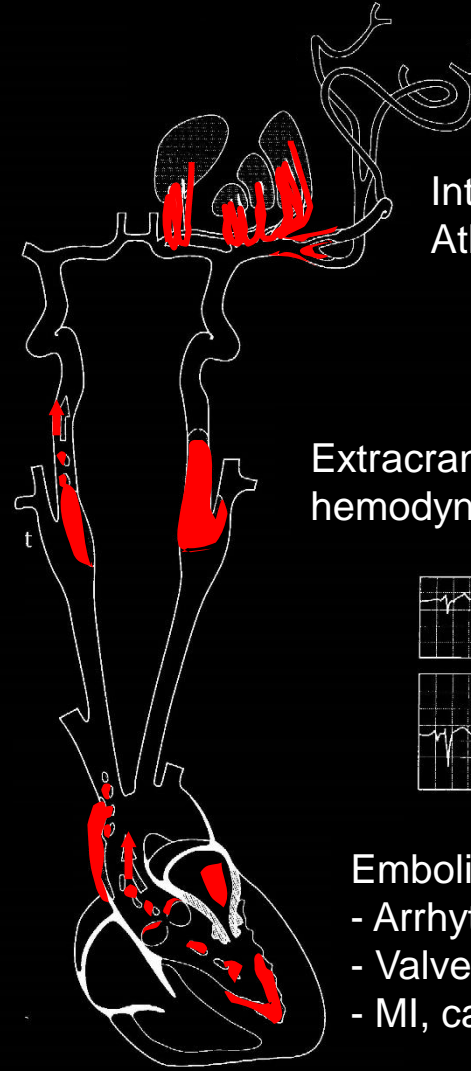
Extracranielle
Atheromatosis,
arterio-arterial
emboli

Extracranial occlusion,
hemodynamic insufficiency

20%

Atheromatosis
and emboli

Emboli from the heart
- Arrhythmia, atrial fibrillation
- Valve issues, PFO
- MI, cardiomyopathy



Epidemiology?

Stroke facts

- 3rd common **cause of death** in Western countries
- 2nd common cause of **dementia**
- Most common cause of **handicap**
- Aprox. **16`000** registered cases in CH / year
- Considerable **costs** for society

Every 2 seconds: 1 stroke

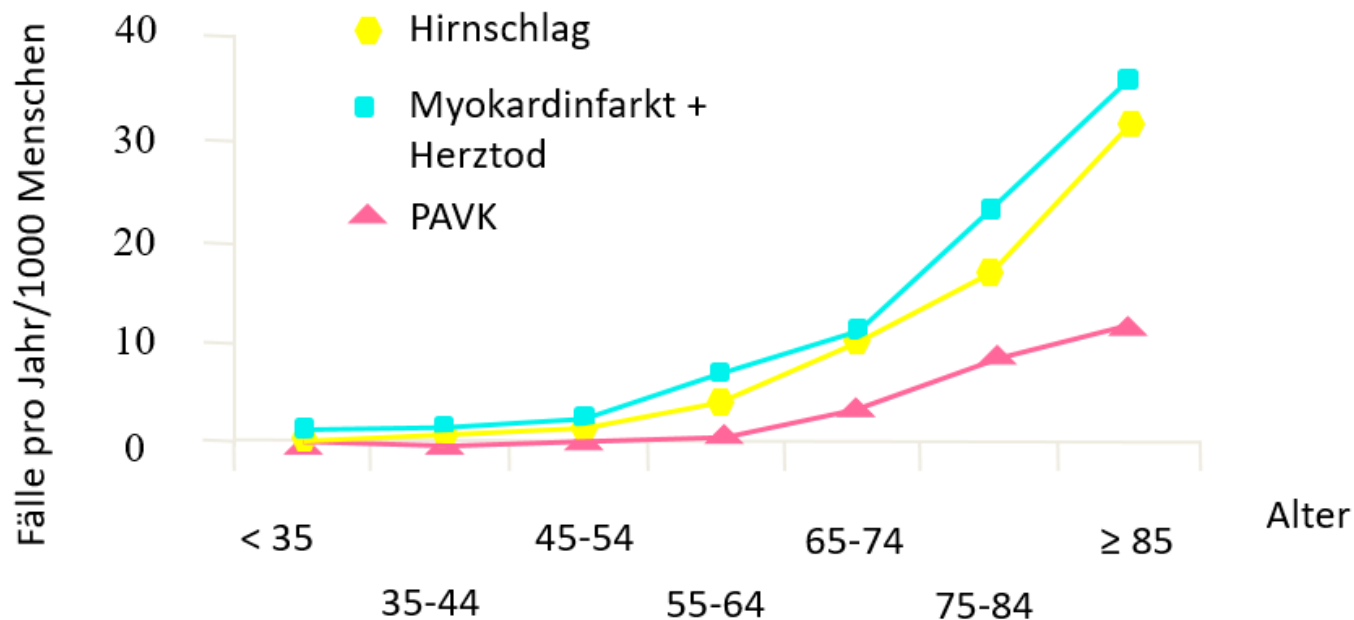
Every 6 seconds: 1 stroke death & 1 stroke handicap

Stroke risk: «1 in 6»

What is more common –
myocardial infarction
or stroke?

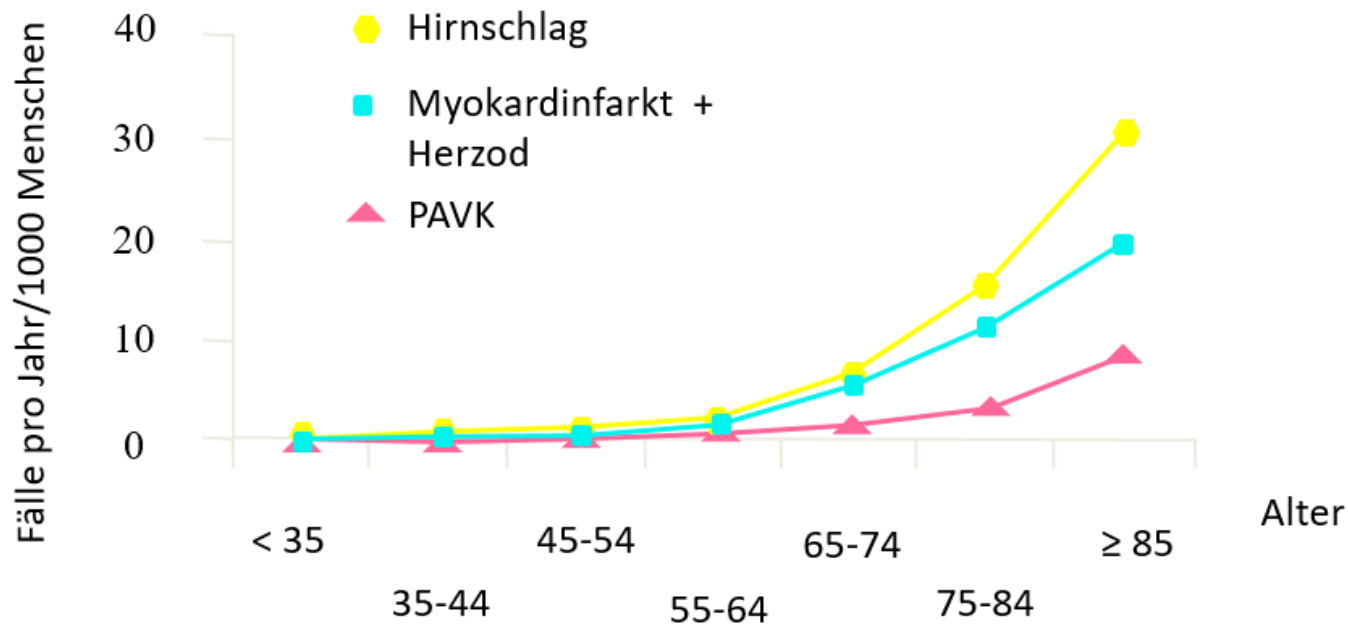
Hirnschlaginzidenz bei Männern

Rothwell et al, Oxford Vascular Study, Lancet 2005



Hirnschlaginzidenz bei Frauen

Rothwell et al, Oxford Vascular Study, Lancet 2005



Risk factors

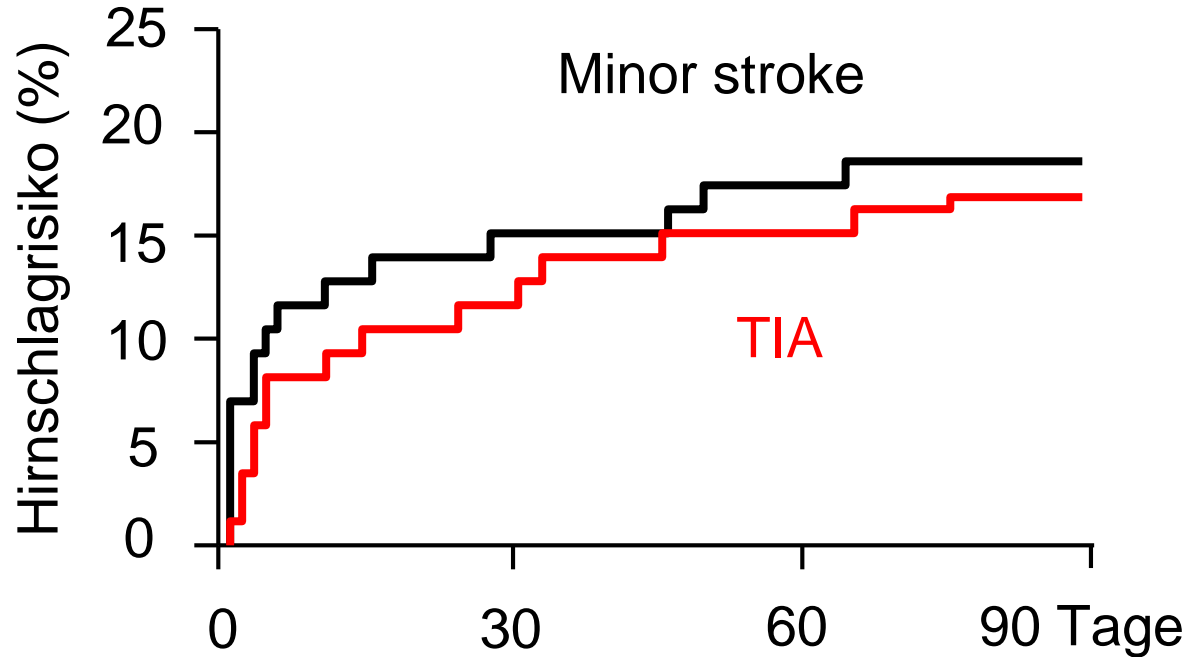
Stroke risk factors

<u>Factor</u>	<u>Relative Risk</u>
• Age > 85 years	8
• Hypertension	4-6
• Diabetes	1.8-6
• Atrial fibrillation	2.6-4.5
• Physical inactivity	2.7
• Adipositas	1.8-2.4
• Asymptomatic carotid artery stenosis	ca. 2
• Unhealthy diet	ca. 2
• High cholesterol	ca. 2
• Smoking	1.8
• Alcohol	1.5

Stroke risk factors

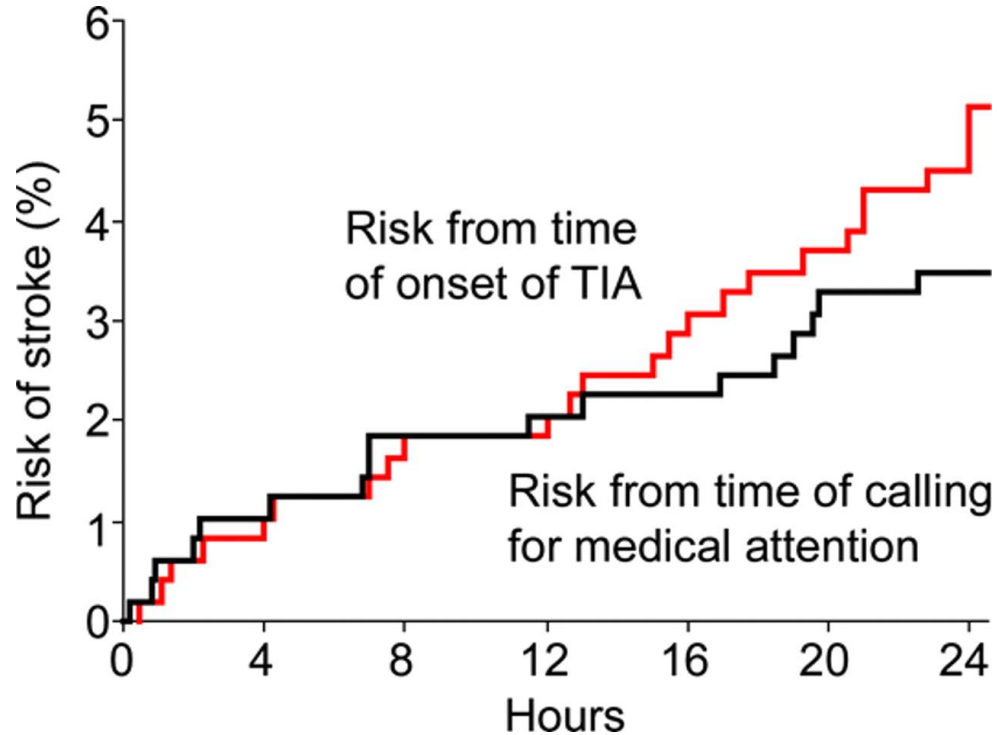
<u>Factor</u>	<u>Relative Risk</u>
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• Physical inactivity	2.7
• Adipositas	1.8-2.4
• Asymptomatic carotid artery stenosis	ca. 2
• Unhealthy diet	ca. 2
• High cholesterol	ca. 2
• Smoking	1.8
• Alcohol	1.6

Stroke risk after TIA / minor stroke

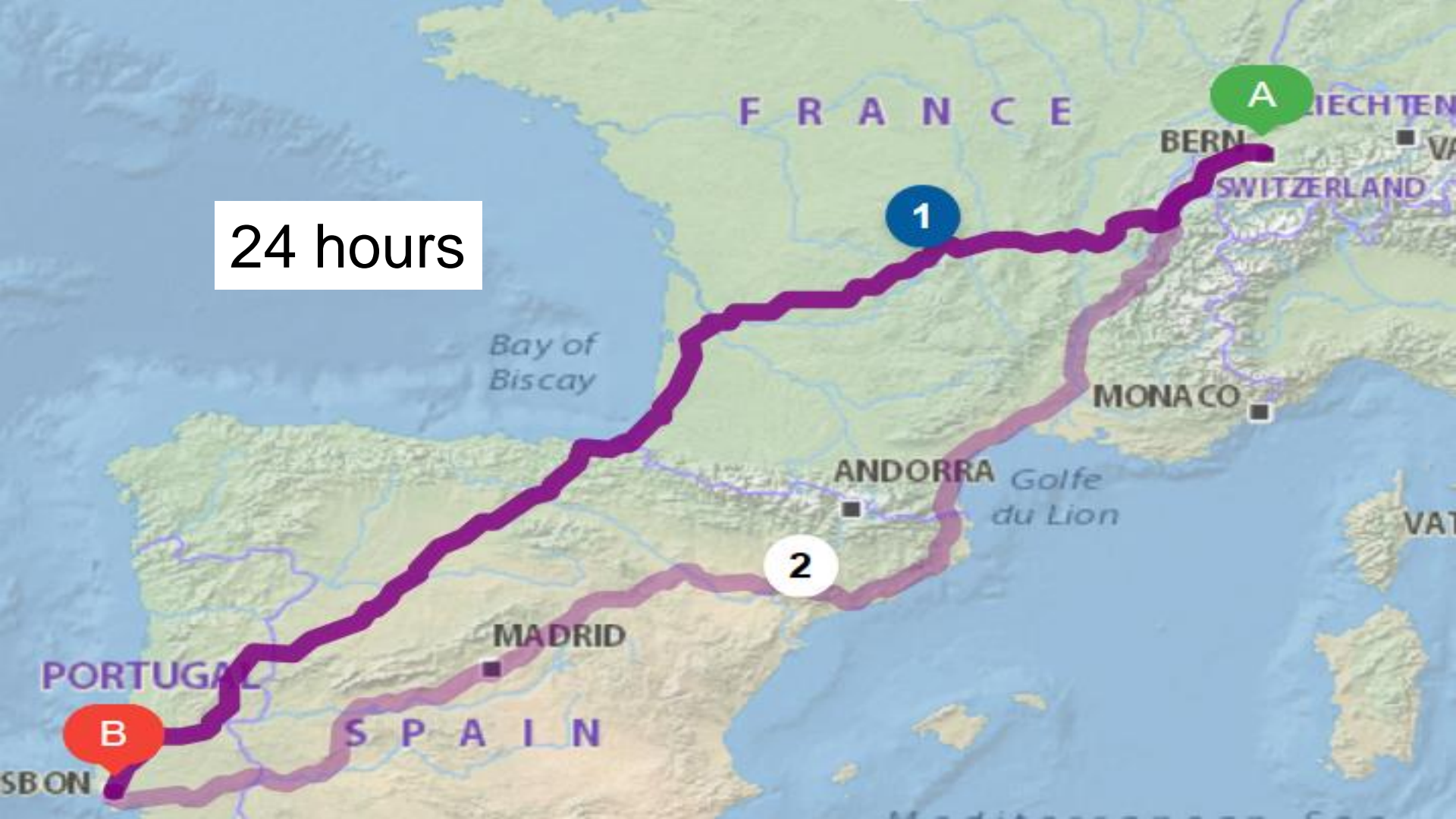


Stroke risk within
24 hours?

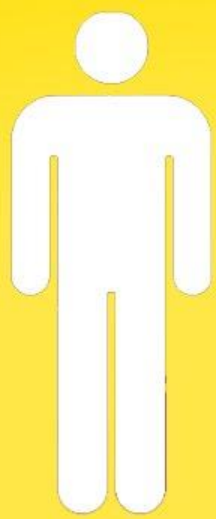
24h risk



24 hours



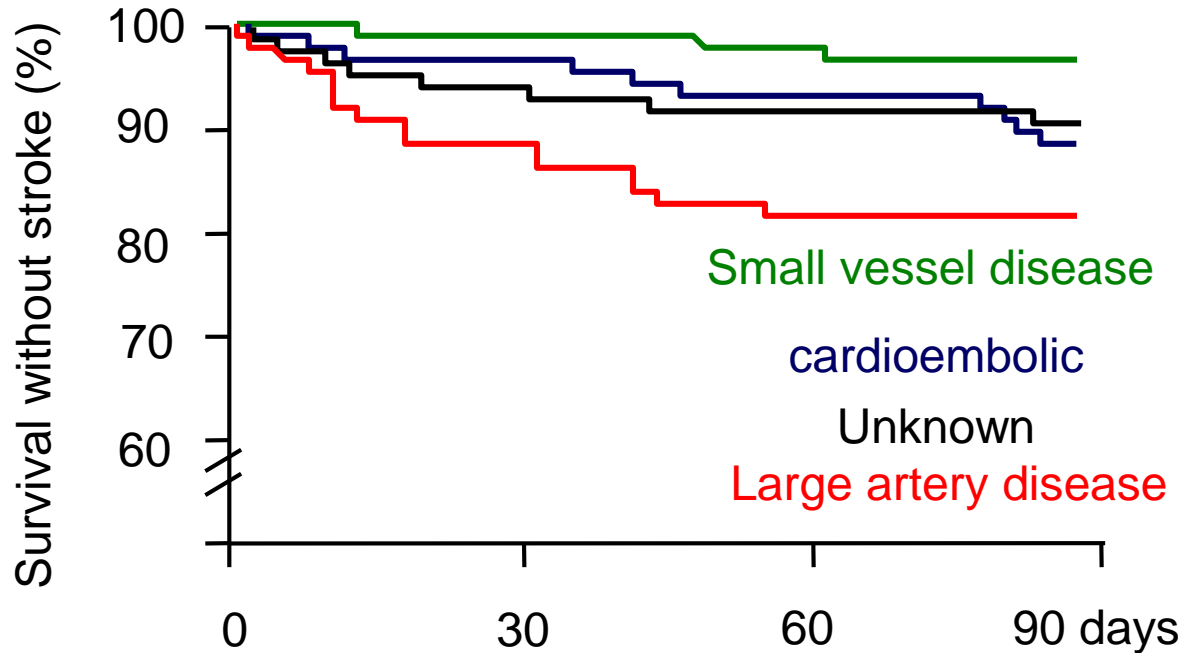






Risk related to aetiology!

Oxford Vascular Study, Lovett et al. Neurology 2004; 62: 569-574

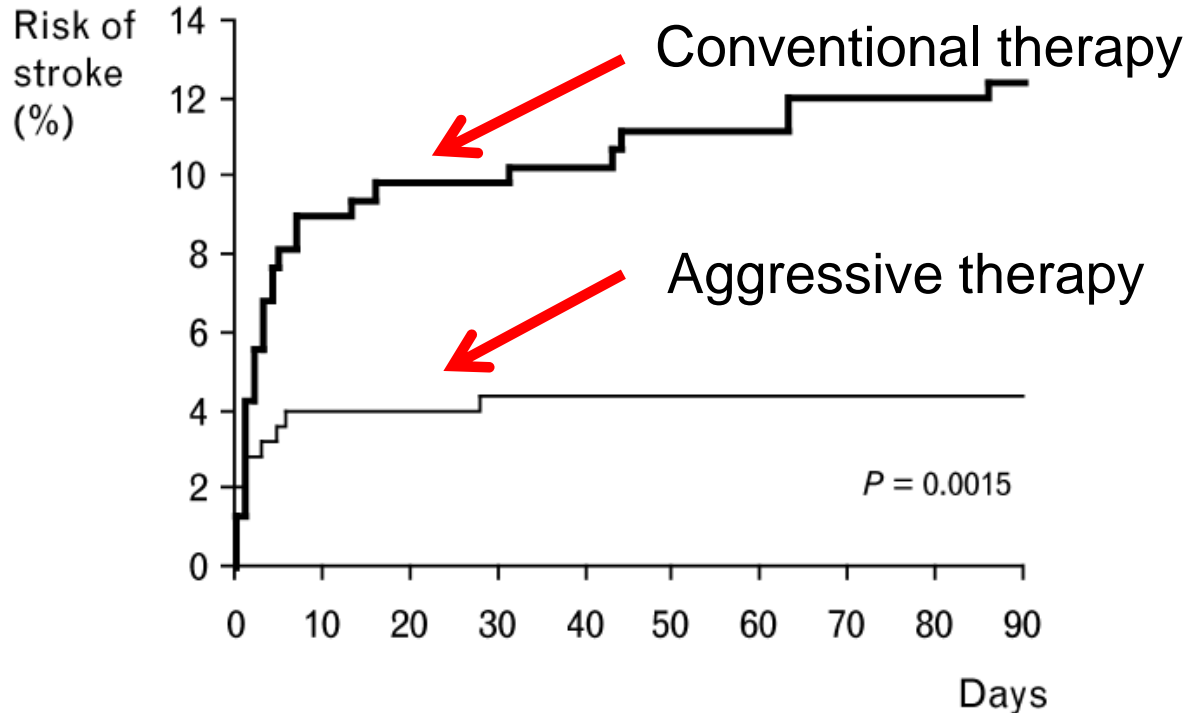


TIA is an emergency



Aggressive investigation helpful!

Lancet 2007;370:1432-1442



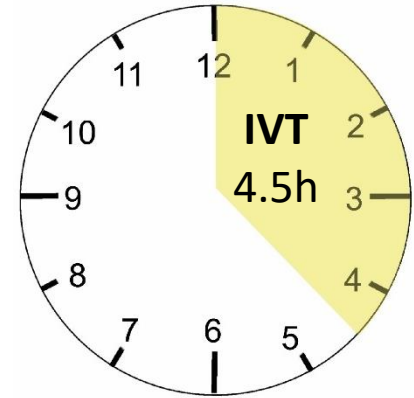
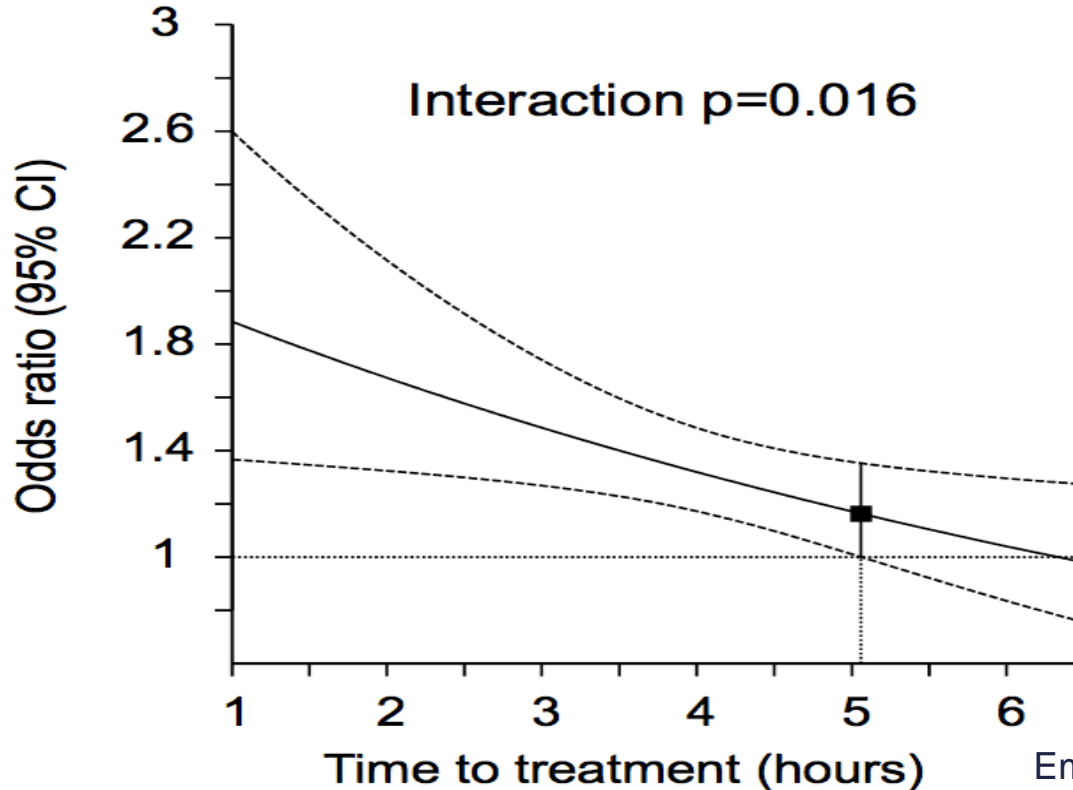
80%
relativ
risk
reduction!

Strokes can
be treated!

Organising
the stroke network!

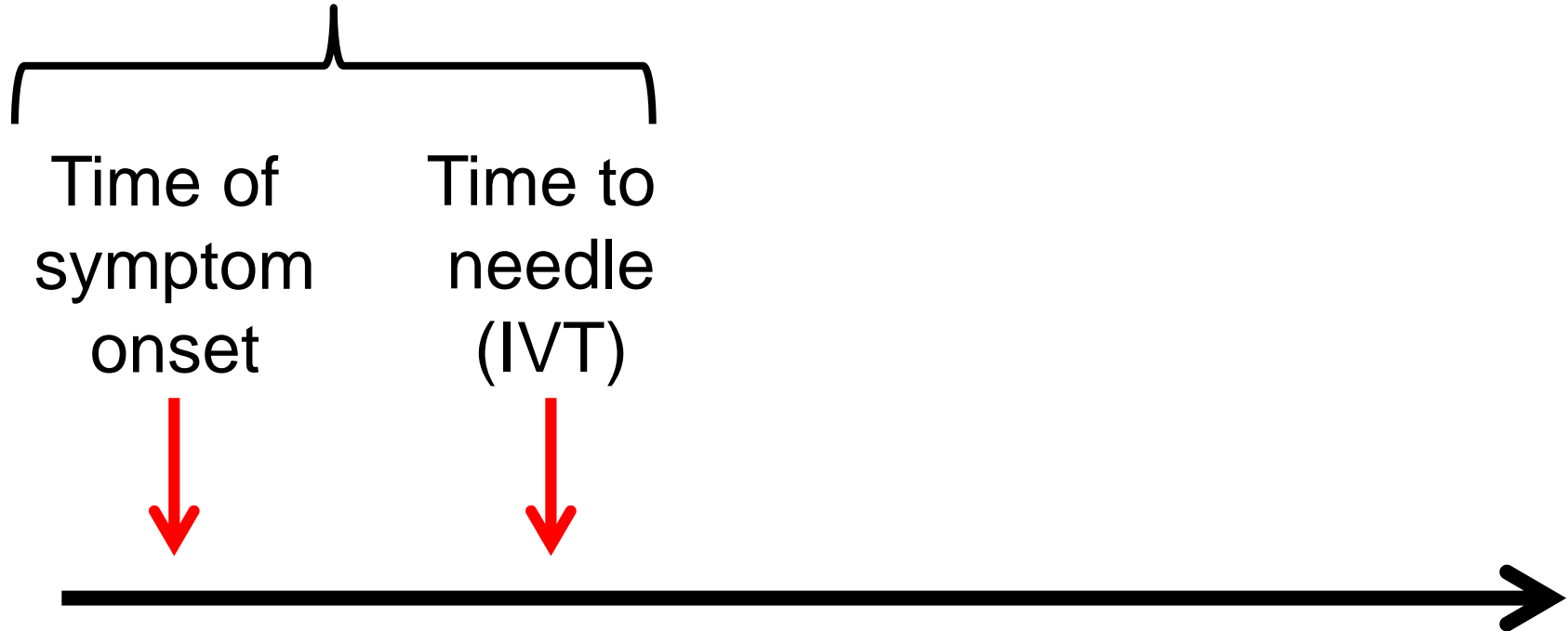
Effect on mRS 0-1 by treatment delay

(ECASS, ATLANTIS, NINDS, EPITHET, IST-3)



Acute stroke treatment

Shorten time to needle!



Endovascular stroke treatment

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

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

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy within 8 Hours after Symptom Onset in Ischemic Stroke

*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

Aspiration Thrombectomy After Intravenous Alteplase Versus Intravenous Alteplase Alone

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Randomized Assessment of Rapid Endovascular Treatment of Ischemic Stroke

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Endovascular Therapy for Ischemic Stroke with Perfusion-Imaging Selection



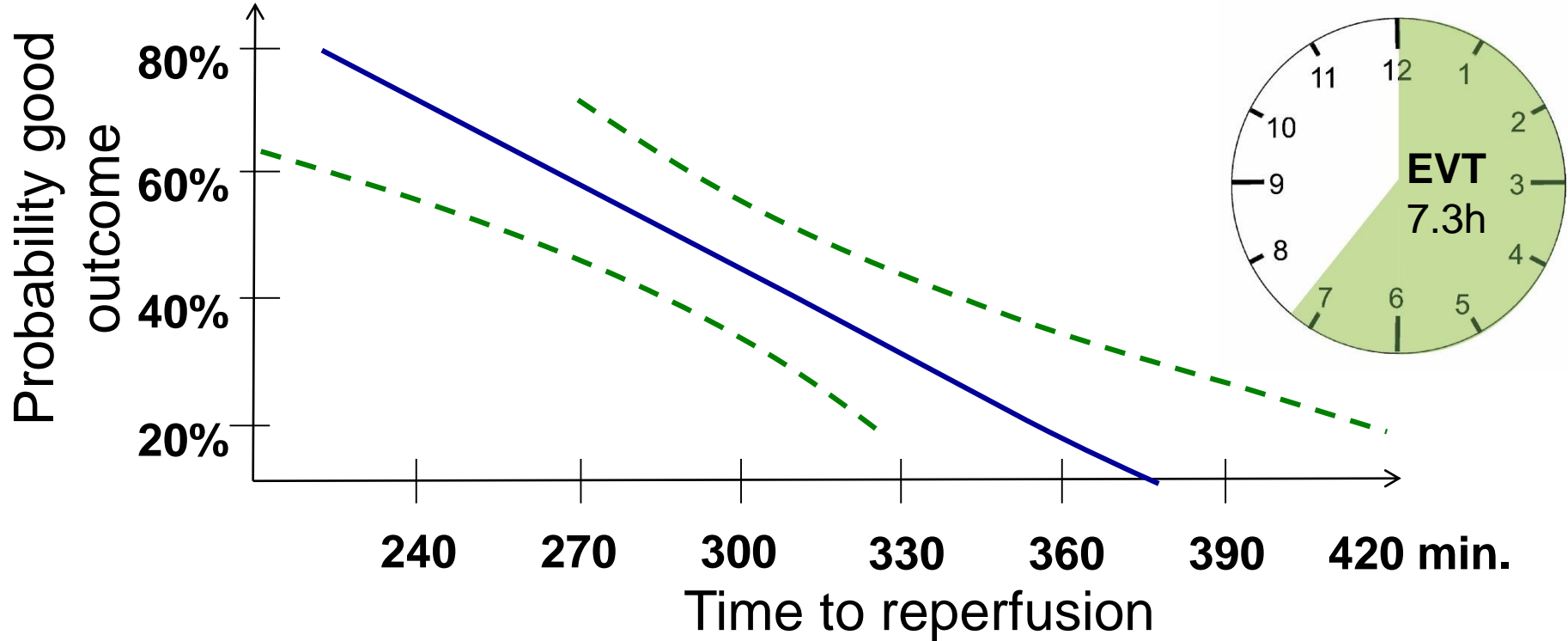
Mechanical thrombectomy after intravenous alteplase versus alteplase alone after stroke (THRACE): a randomised controlled trial

Serge Bracard, Xavier Ducrocq, Jean Louis Mas, Marc Soudant, Catherine Oppenheim, Thierry Moulin, Francis Guillemin, on behalf of the THRACE Investigators*

RESEARCH PAPER

Endovascular therapy for acute ischaemic stroke: the Pragmatic Ischaemic Stroke Thrombectomy Evaluation (PISTE) randomised, controlled trial

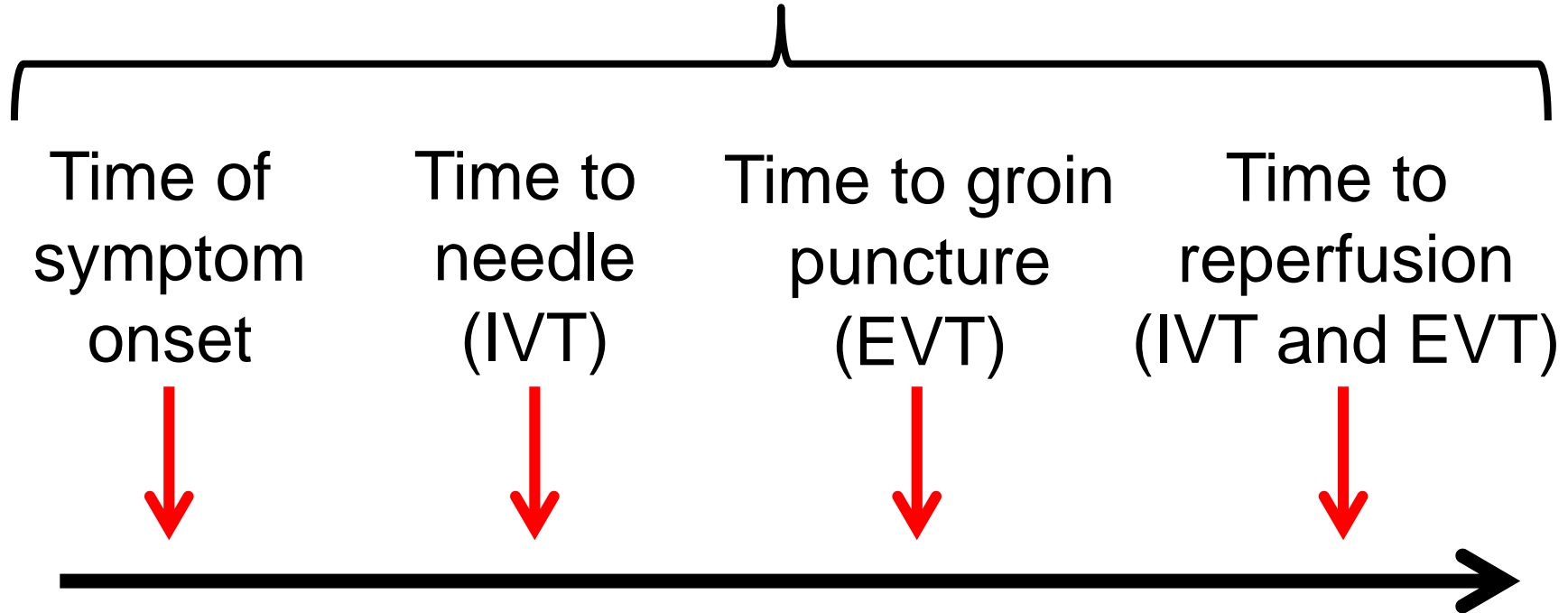
Benefit of endovascular reperfusion



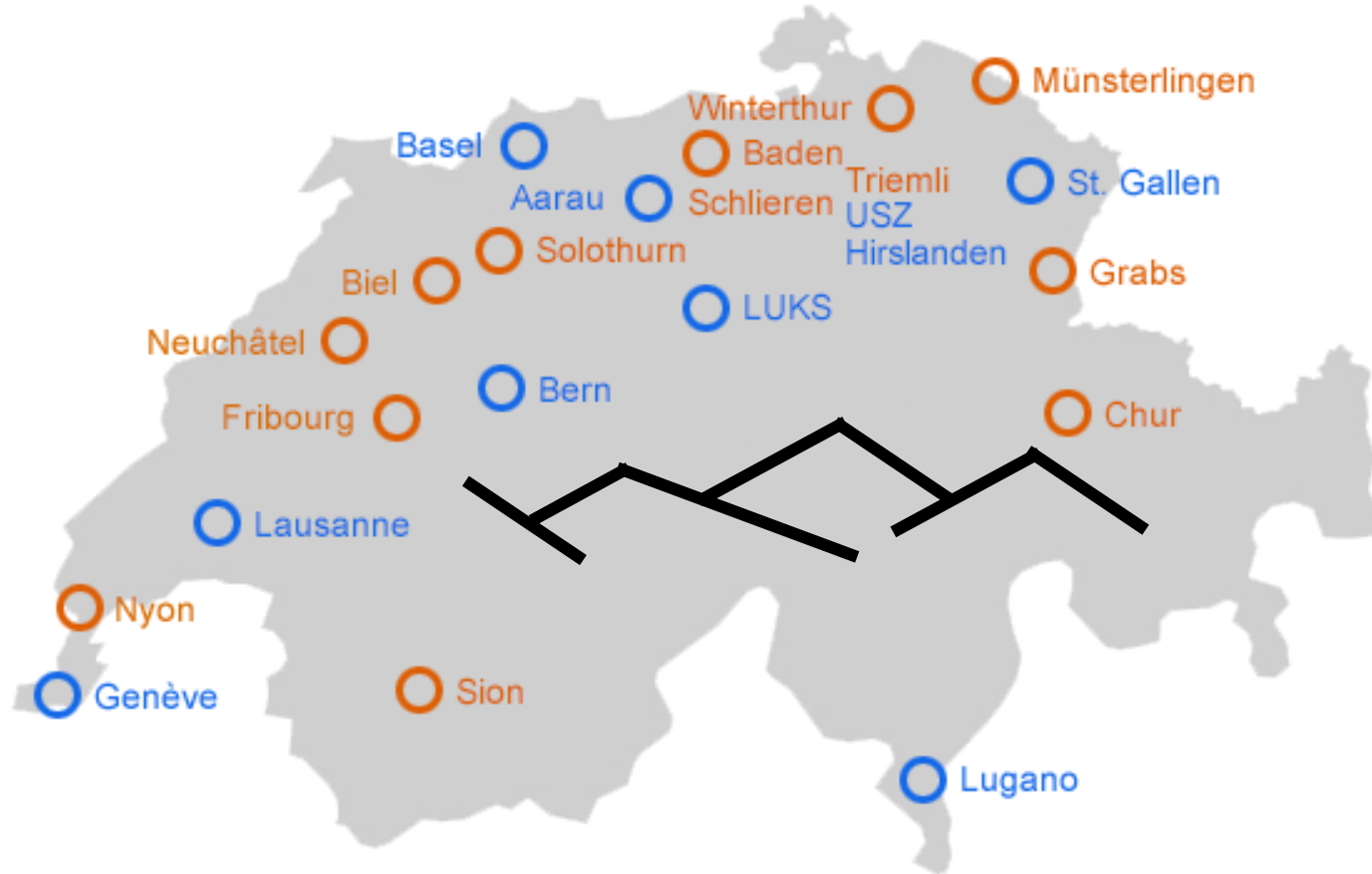
Prabhakaran JAMA 2015; Khatri Lancet Neurology 2014; Mazhigi Circulation 2013

Acute stroke treatment

Shorten time to reperfusion!



Stroke centers and units

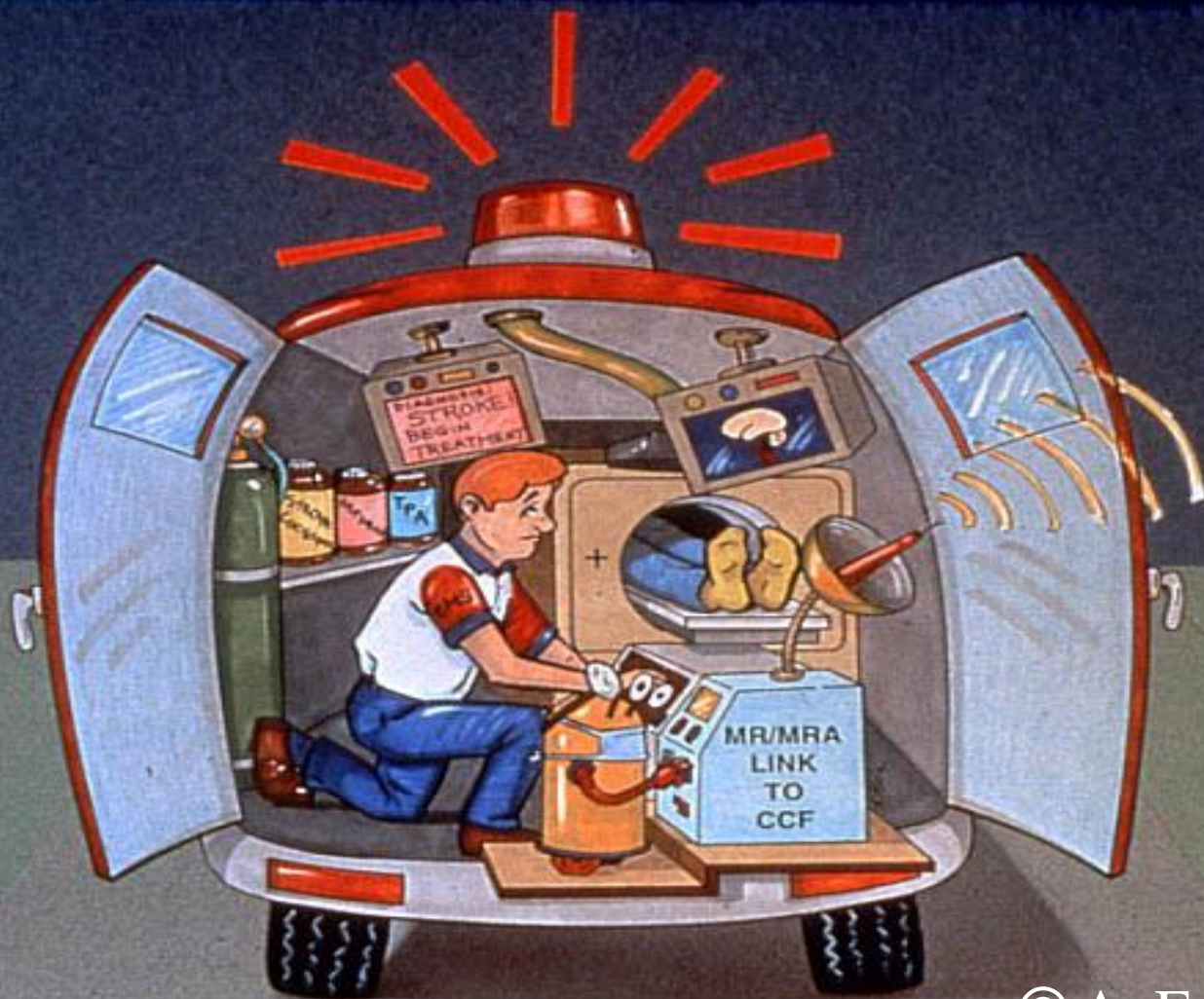


Swiss stroke centers and units

	Unit	Center
24/7 h stroke neurologist presence	x	x
Neuroradiological expertise (or teleradiology)	< 30 Min	< 30 Min
Interventional neuroradiologist		x
Neurosurgeon		x
IV thrombolysis	x	x
IA recanalization techniques		x

Models of prehospital stroke management

1986 CCF



© A. Furlan, USA



World's First Vehicle Based CT

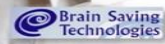


Cocktail Cabinet

IV / tPA



TeleMed
Wireless Communication



Mobile stroke units for prehospital thrombolysis, triage, and beyond: benefits and challenges



Klaus Fassbender, James C Grotta, Silke Walter, Iris Q Grunwald, Andreas Radoschke-Schumm, Jeffrey L Saver

In acute stroke management, time is brain. Bringing swift treatment to the patient, instead of the conventional approach of awaiting the patient's arrival at the hospital for treatment, is a potential strategy to improve clinical outcomes after stroke. This strategy is based on the use of an ambulatory (mobile stroke unit) equipped with an

Lancet Neurol 2017; 16: 227-37

This online publication has been corrected.

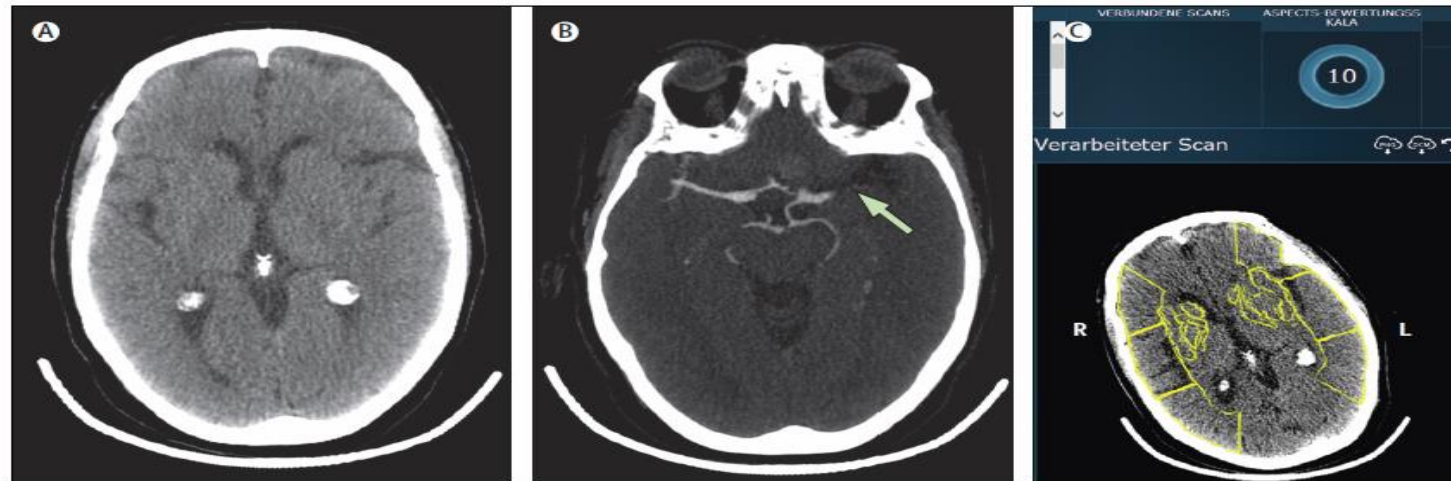


Figure 2: Multimodal imaging in a mobile stroke unit

Non-contrast CT (A), CT angiography (B), and ASPECTS (C) done in a mobile stroke unit of a 73-year-old woman with acute right hemiparesis. Although the parenchyma shows no signs of infarction (ASPECTS 10), CT angiography allowed prehospital diagnosis of an occlusion of the left middle cerebral artery (B, arrow). Reproduced from Grunwald et al,⁴¹ by permission of *Cerebrovascular Diseases* (Karger). ASPECTS=Alberta Stroke Program Early CT Score.













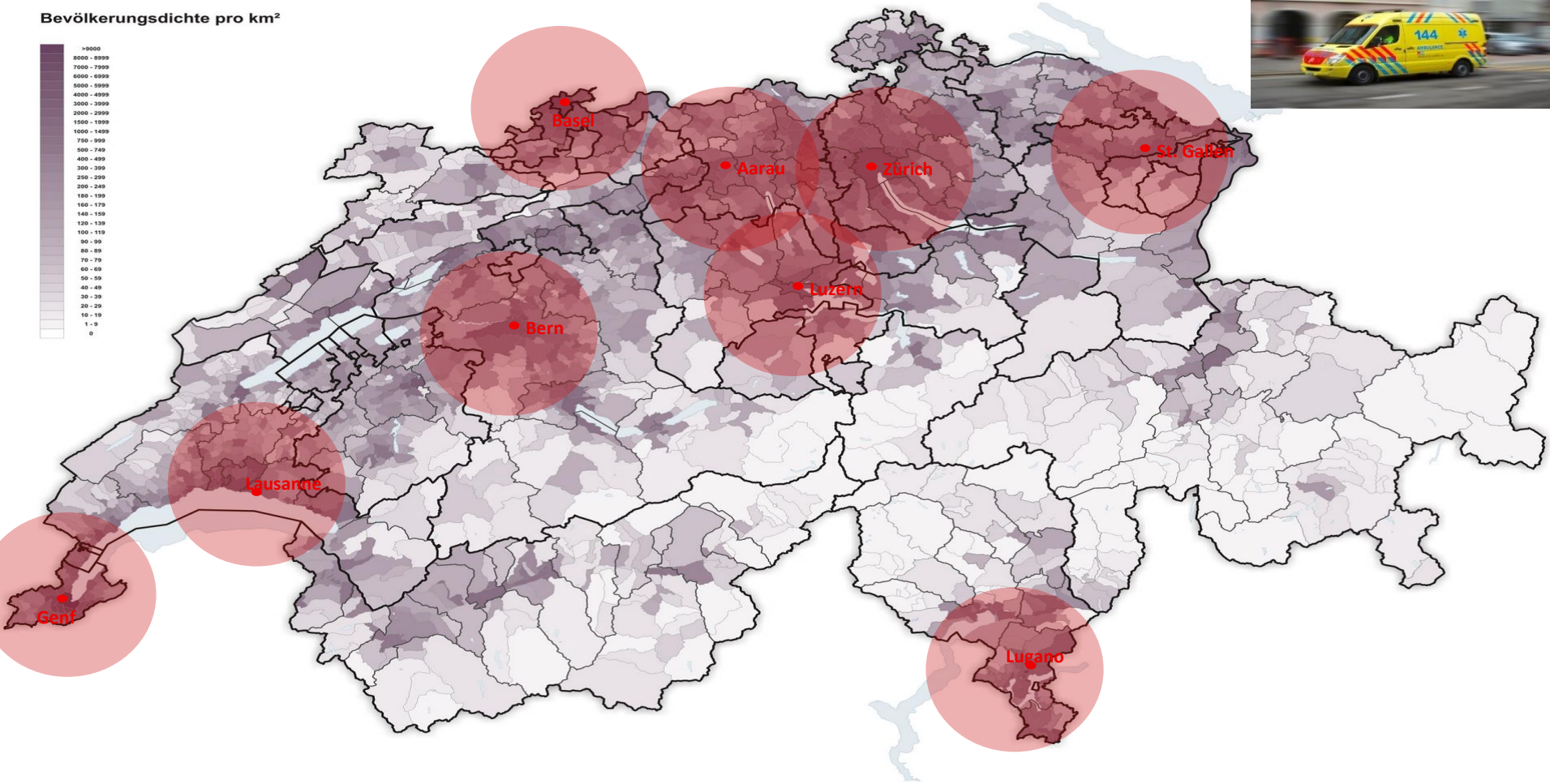
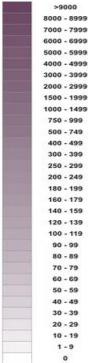
Alternatives?

Ideal candidates for direct transport

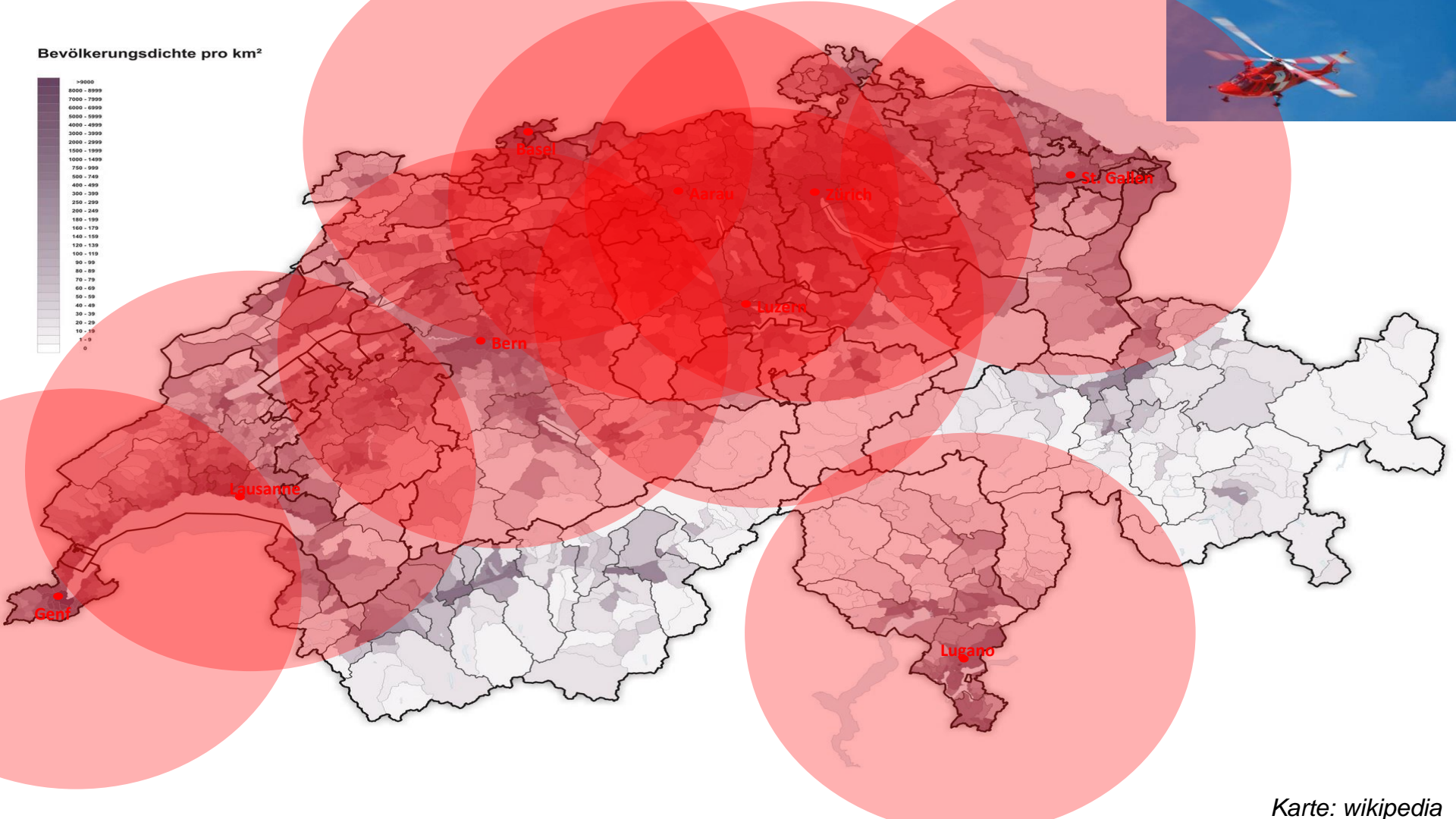
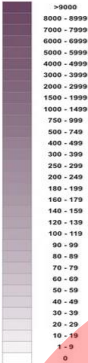
- High suspicion of LVO
- Time from symptom onset >4h and <24 hours
- Contraindications for IVT
 - Unknown time of symptom onset
 - Wake-up and siesta stroke
 - (N)OAC therapy
 - Prior surgery
 - Etc.



Bevölkerungsdichte pro km²



Bevölkerungsdichte pro km²



Organisation of inhospital pathways

Single point of contact



24h/7d



Inhospital time delays

How to get there?

- EMS involvement / Prenotification
- Clear defined, trained stroke team
- Teamwork
- Neuroradiology prepared
- Ambulance to neuroradiology without time delay
- Rapid neurological exam
- Point of care lab
- Immediate interpretation of the scan
- rtPA premixed, application after imaging on table

09:41

100%

Impressum

StrokeClock

Neu

Bearbeiten

Fertig

Patient

GK

Symptombeginn

17:04

Zeit seit Symptombeginn

03:28

seit Eintritt:

00 : 05 : 42

Neuronenverlust: 10.83 Millionen

<

Eintreffen Bildgebung

>

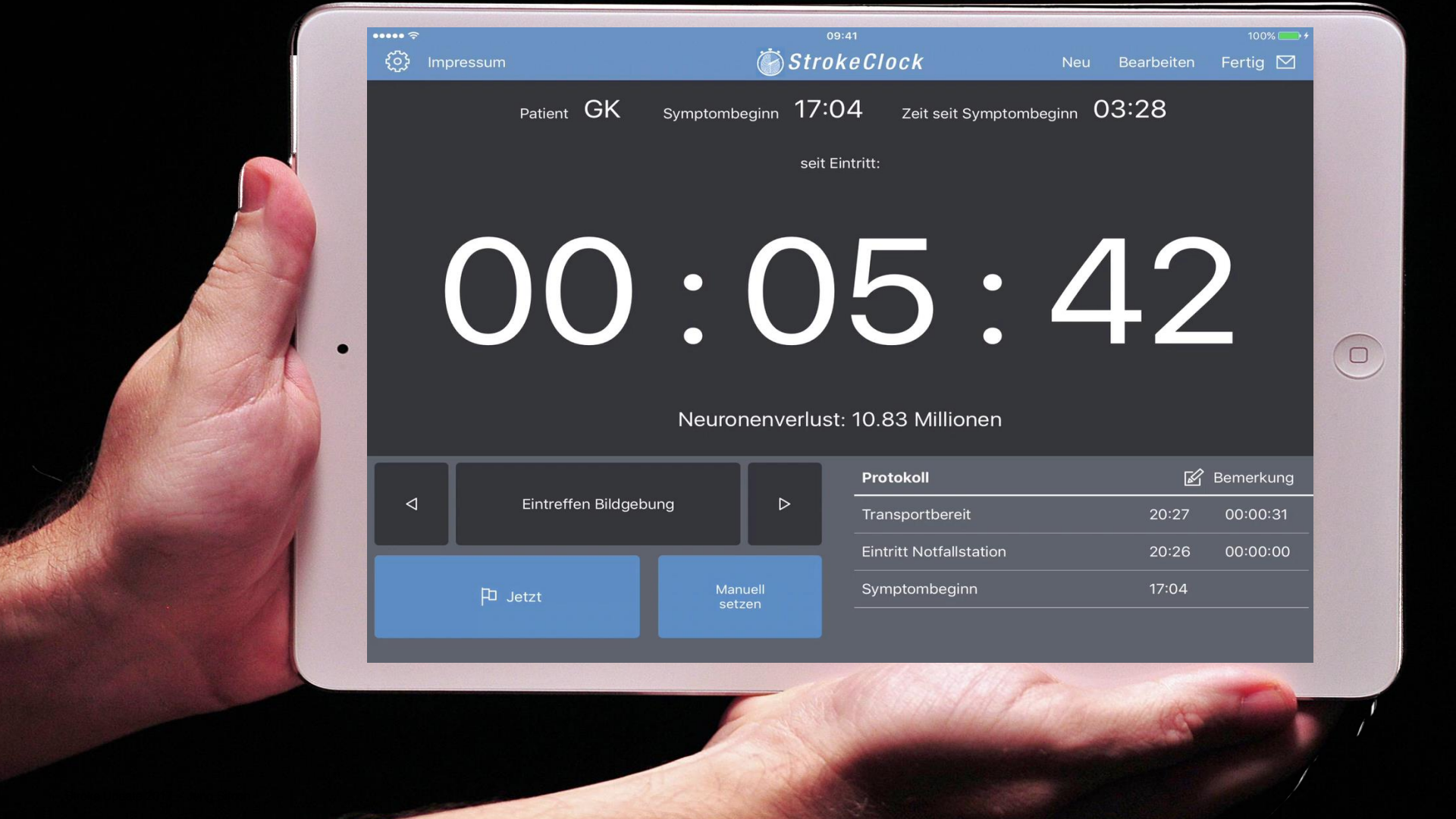
Jetzt

Manuell setzen

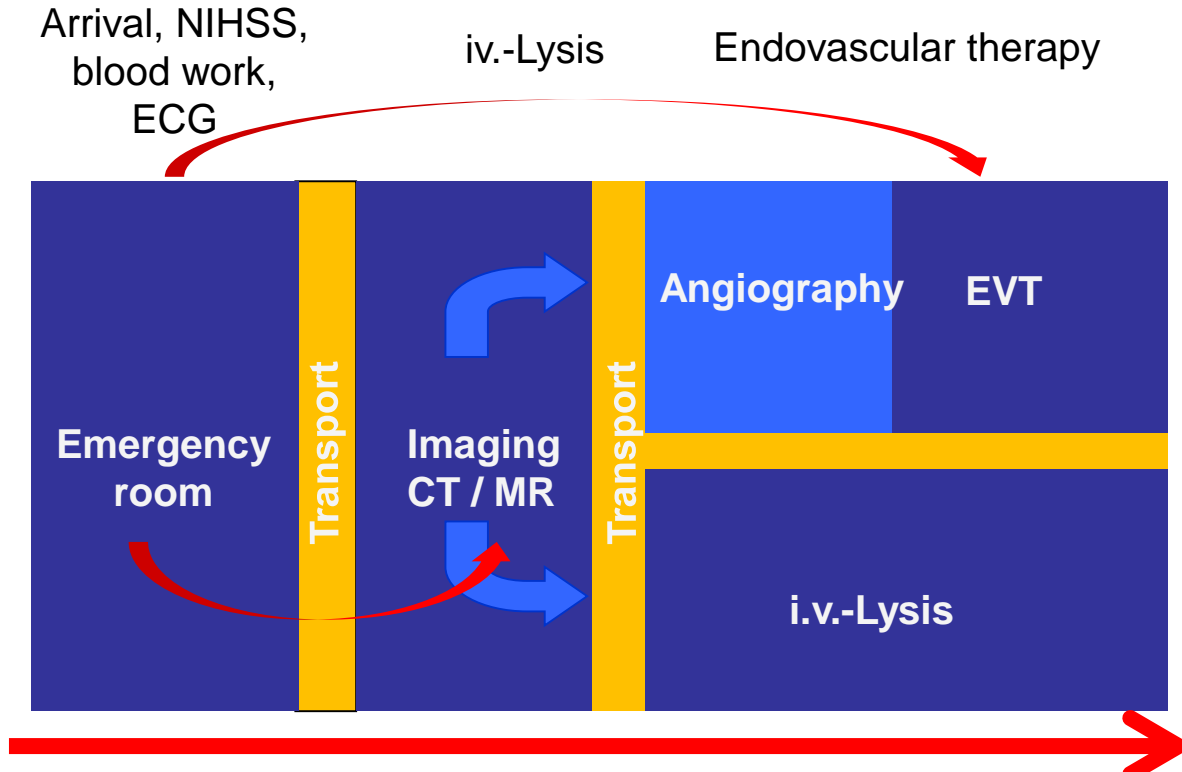
Protokoll

Bemerkung

Transportbereit	20:27	00:00:31
Eintritt Notfallstation	20:26	00:00:00
Symptombeginn	17:04	



Streamline in-hospital stroke pathways

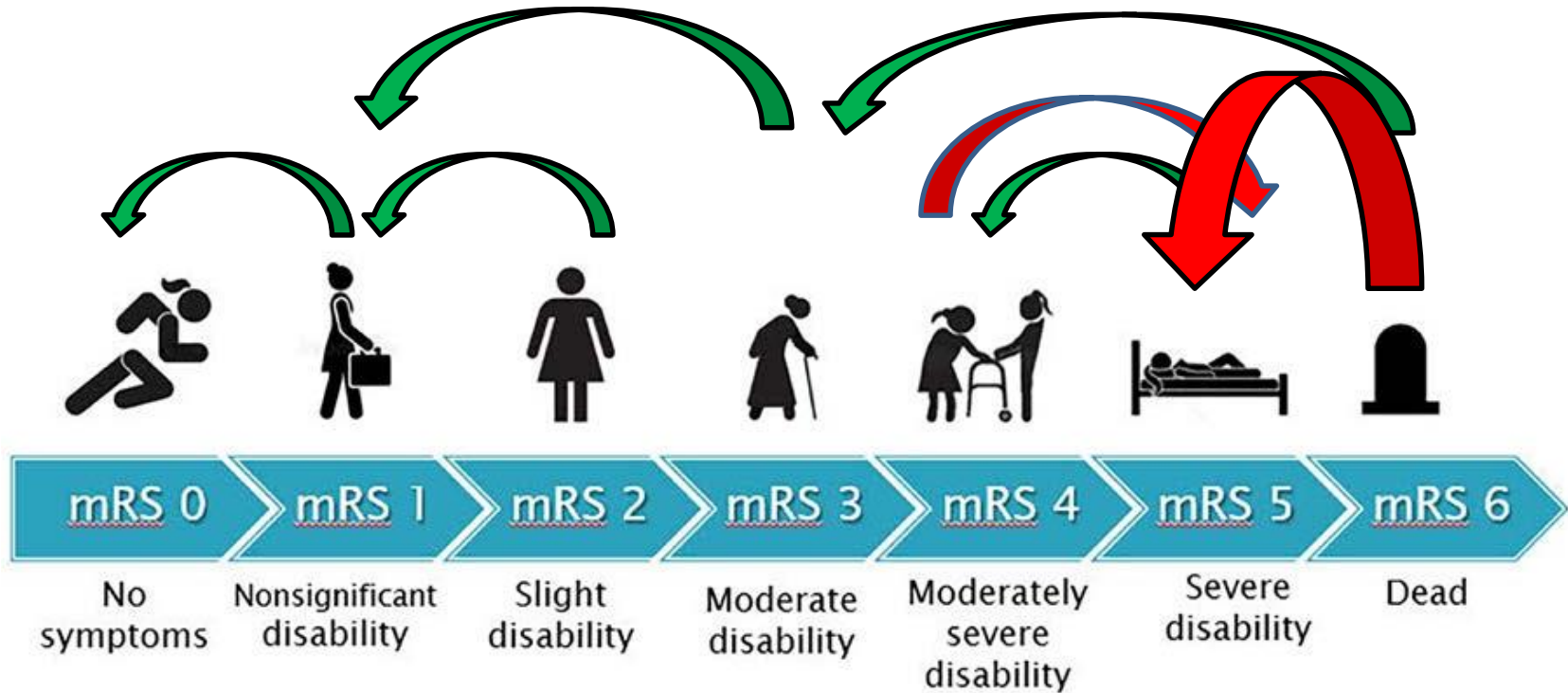


«Door to groin» in 13 minutes...



Acute ischaemic stroke treatment

Modified Rankin Scale



The New England Journal of Medicine

©Copyright, 1995, by the Massachusetts Medical Society

Volume 333

DECEMBER 14, 1995

Number 24

TISSUE PLASMINOGEN ACTIVATOR FOR ACUTE ISCHEMIC STROKE

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

Abstract *Background.* Thrombolytic therapy for acute ischemic stroke has been approached cautiously because there were high rates of intracerebral hemorrhage in early clinical trials. We performed a randomized, double-blind trial of intravenous recombinant tissue plasminogen activator (t-PA) for ischemic stroke after recent pilot studies suggested that t-PA was beneficial when treatment was begun within three hours of the onset of stroke.

Methods. The trial had two parts. Part 1 (in which 291 patients were enrolled) tested whether t-PA had clinical activity, as indicated by an improvement of 4 points over base-line values in the score of the National Institutes of Health stroke scale (NIHSS) or the resolution of the neurologic deficit within 24 hours of the onset of stroke. Part 2 (in which 333 patients were enrolled) used a global test statistic to assess clinical outcome at three months, according to scores on the Barthel index, modified Rankin scale, Glasgow outcome scale, and NIHSS.

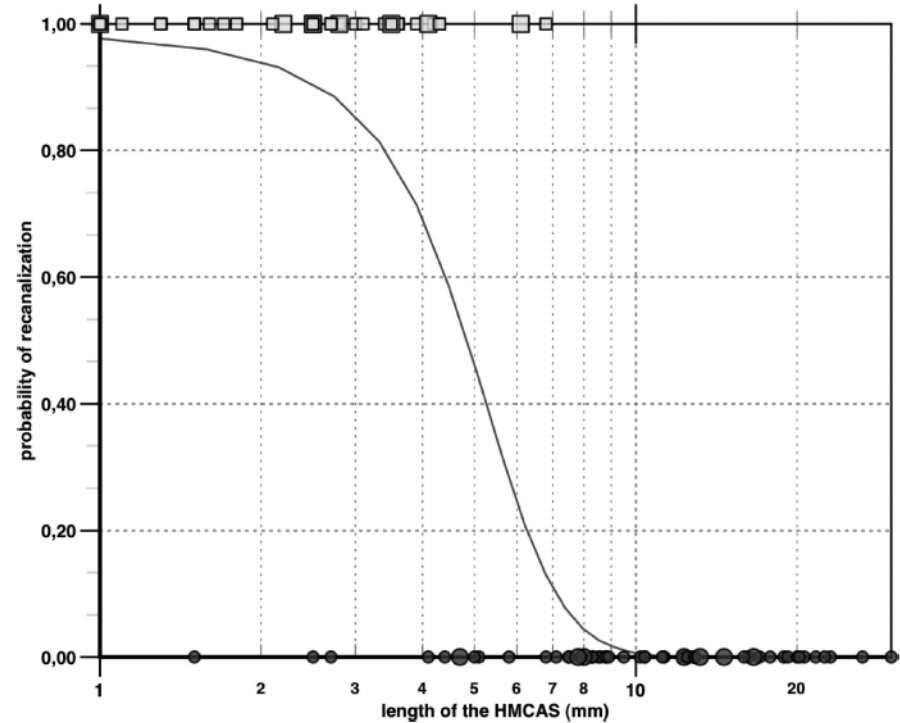
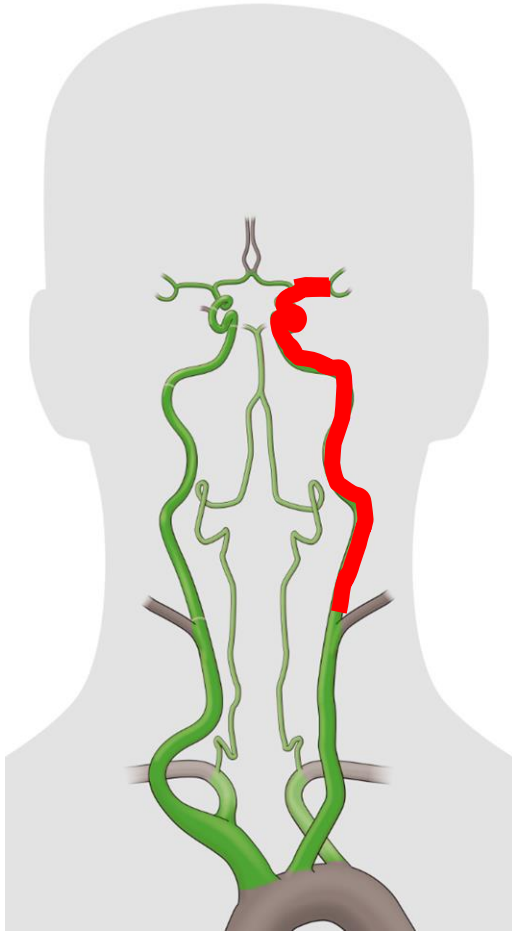
Results. In part 1, there was no significant difference between the group given t-PA and that given placebo in

the percentages of patients with neurologic improvement at 24 hours, although a benefit was observed for the t-PA group at three months for all four outcome measures. In part 2, the long-term clinical benefit of t-PA predicted by the results of part 1 was a favorable outcome, 1.7; 1.2 to 2.6). As compared with patients treated with t-PA, patients in the placebo group were more likely to have minimal or no improvement on the assessment scales. Intracerebral hemorrhage within 36 hours after stroke occurred in 6.4 percent of patients in the t-PA group and in 6.4 percent of patients in the placebo group (P = 0.99). At three months, the percentage of patients who were alive and without disability was 17 percent in the t-PA group and 17 percent in the placebo group (P = 0.99).

Conclusions. Despite the results of part 1, intravenous t-PA within three hours of the onset of stroke improved clinical outcome at three months (P = 0.06). (N Engl J Med 1995;333:1581-7.)



IVT und Rekanalisation



Riedel et al. Stroke. 2011 42:1775-1777.

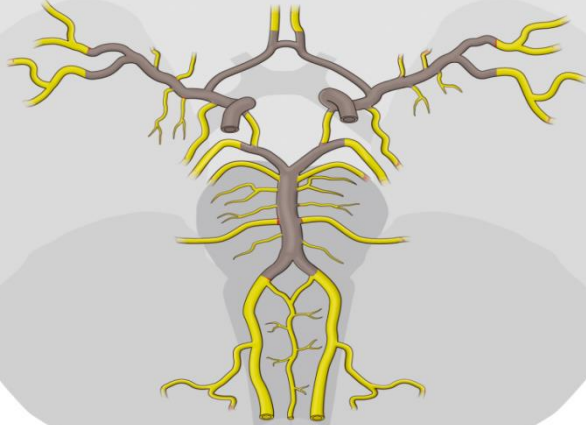


Copyright © 2012 Stryker

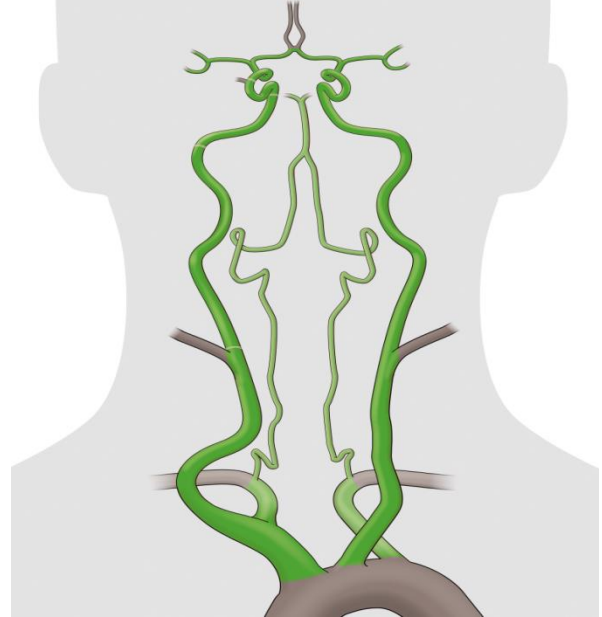
90795934.AB

Best candidates for...

IVT

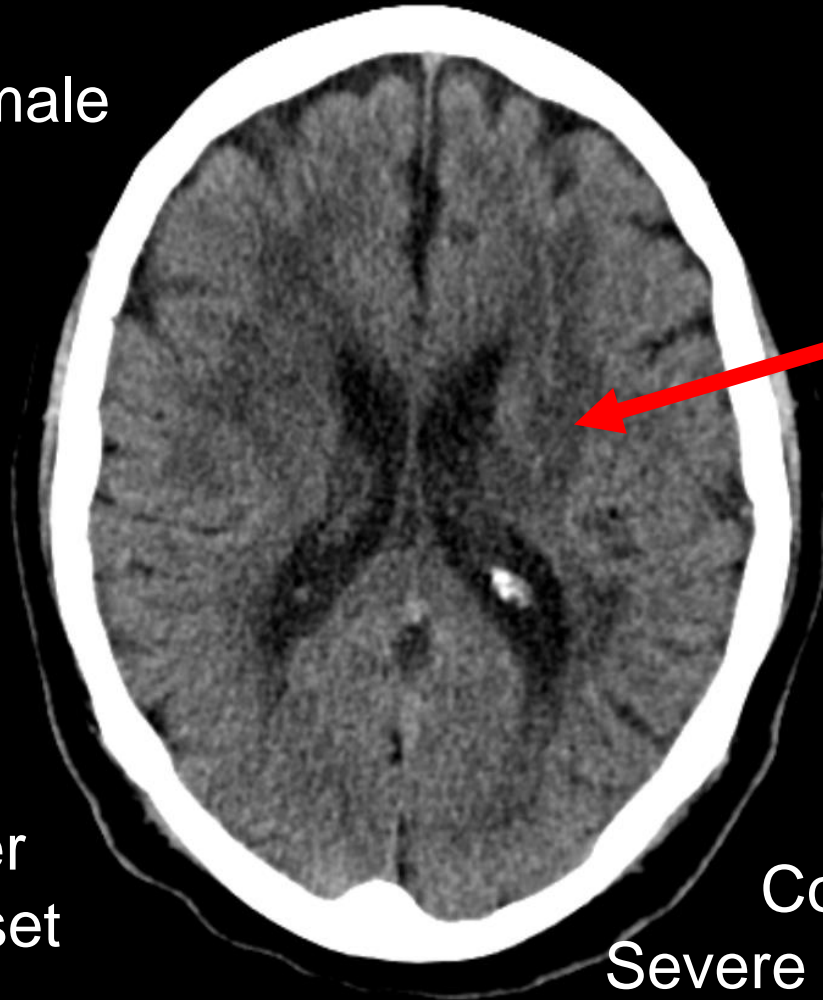


\pm IVT+EVT



74 year old female

NIHSS 6



3,5 hours after
symptom onset

Cognitive decline
Severe arterial hypertension

«TO TREAT» or «NOT TO TREAT»



Should IVT be given?

A: Of course – clear indication for IVT!

B: No, she has a severe hypertension!

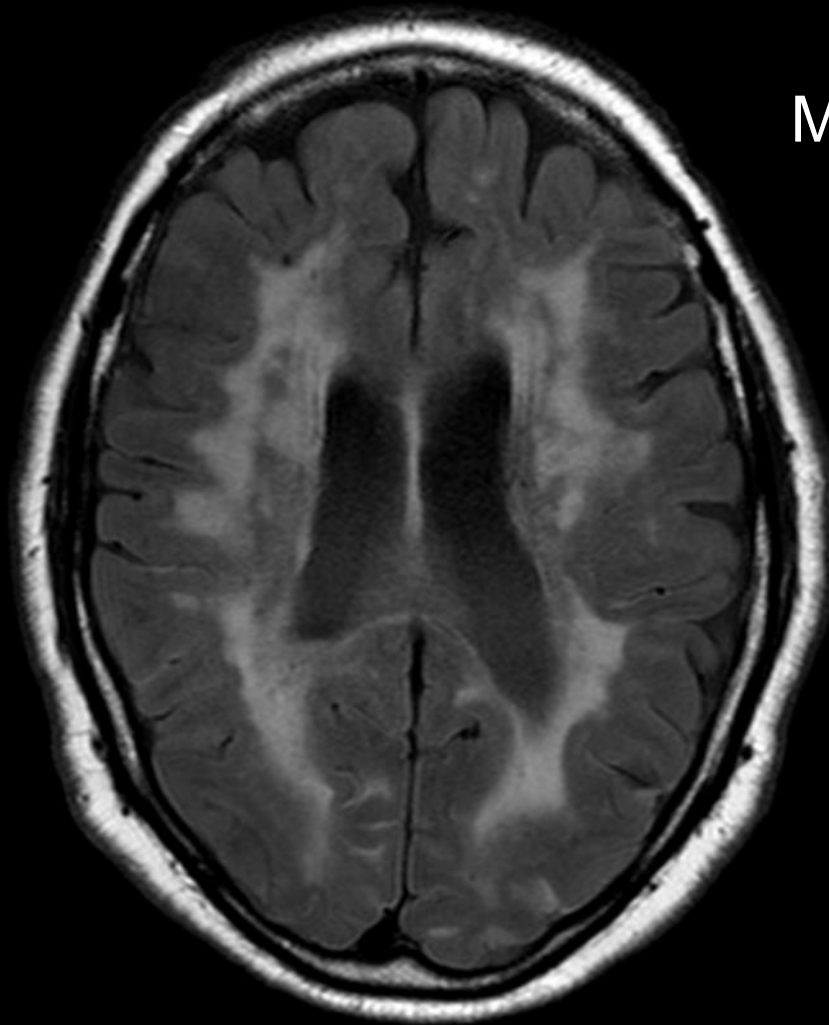
C: No, she is demented!

D: No, she has small vessel disease!

E: No idea, I will ask my boss!

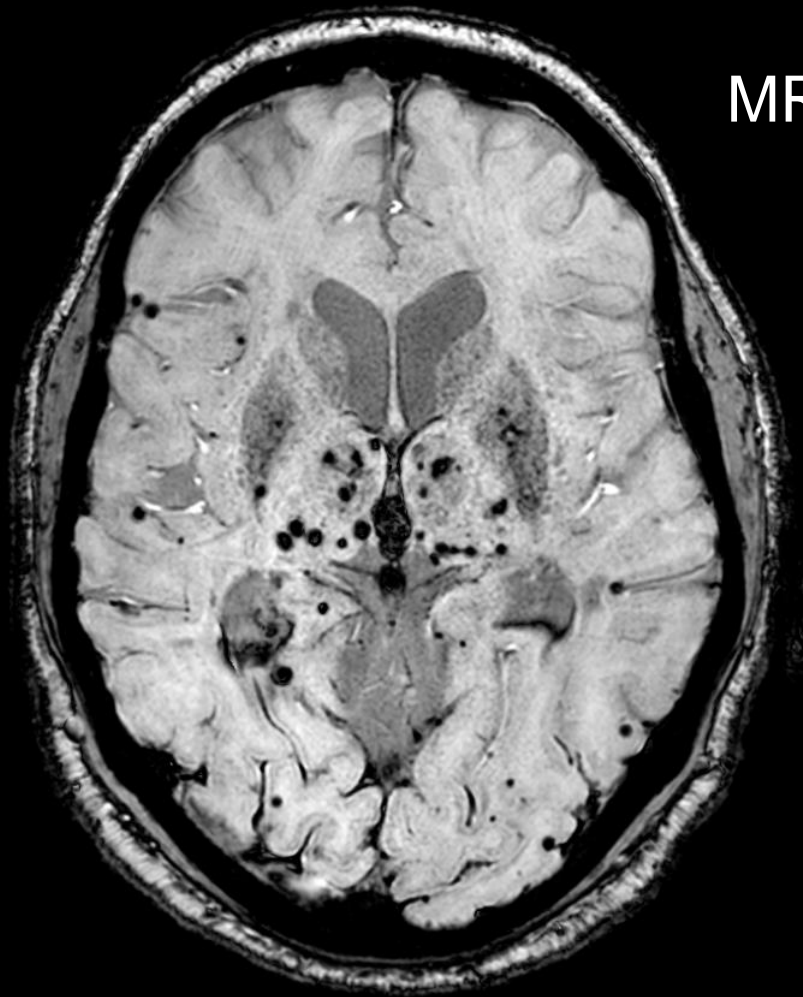
FLAIR

MRI 2 years before



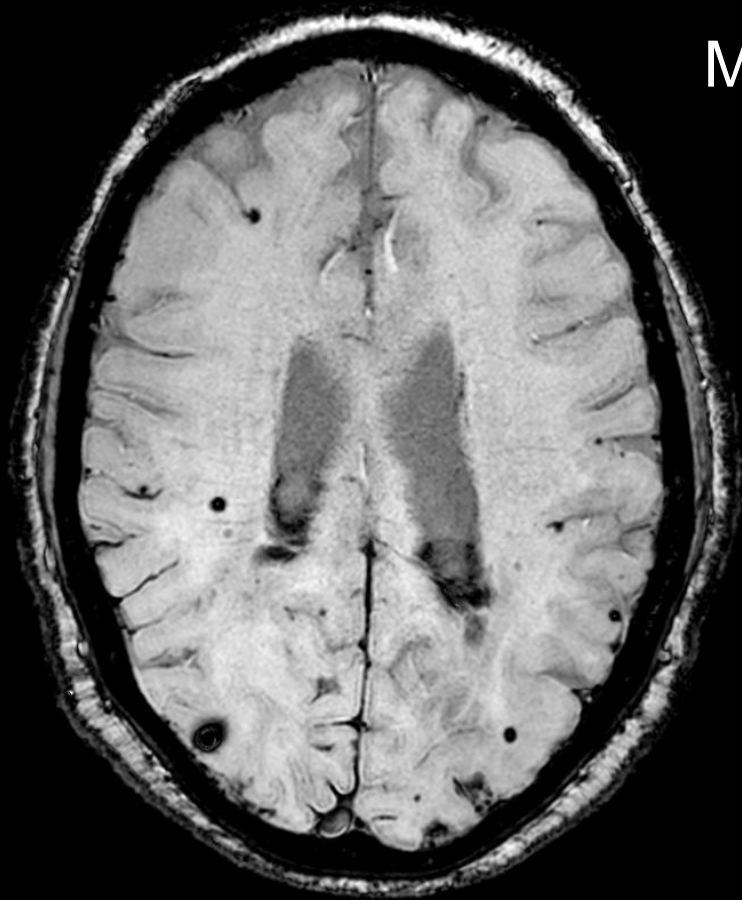
SWI

MRI 2 years before



SWI

MRI 2 years before



Should IVT be given?

A: Of course – still a clear indication for IVT!

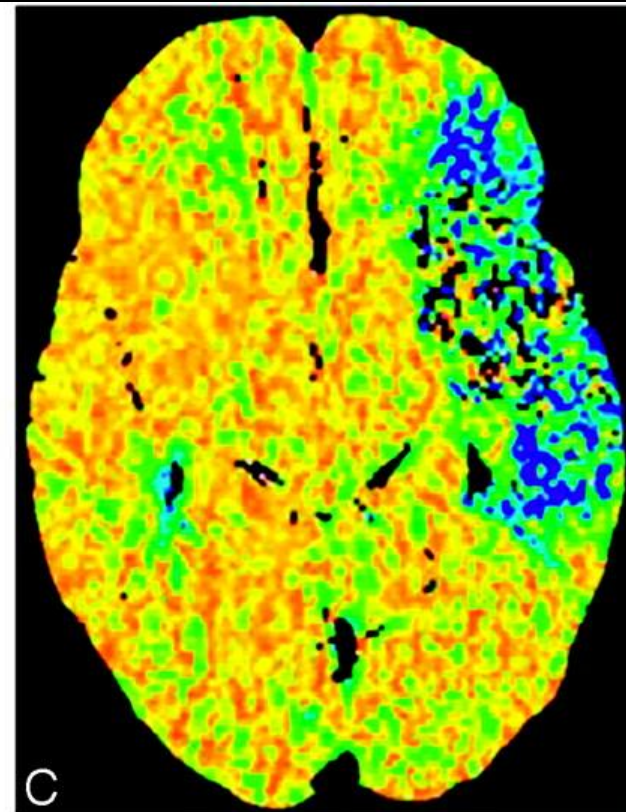
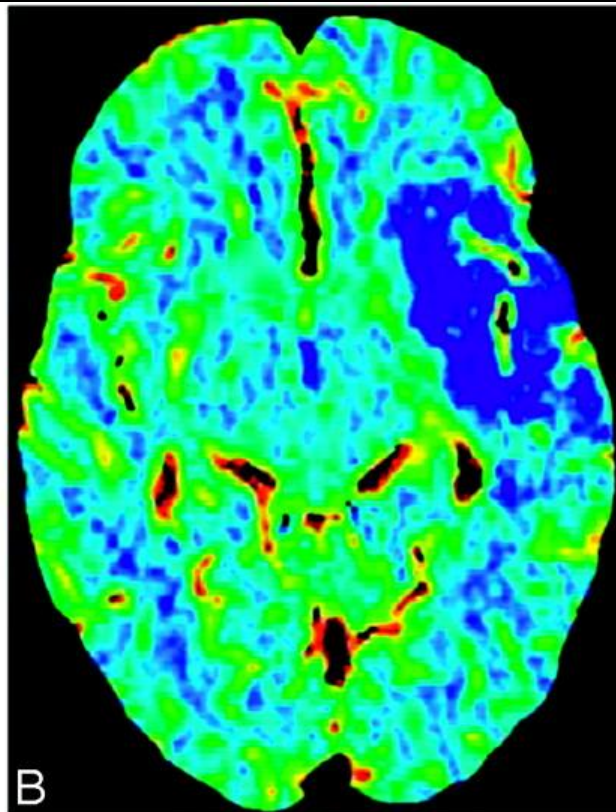
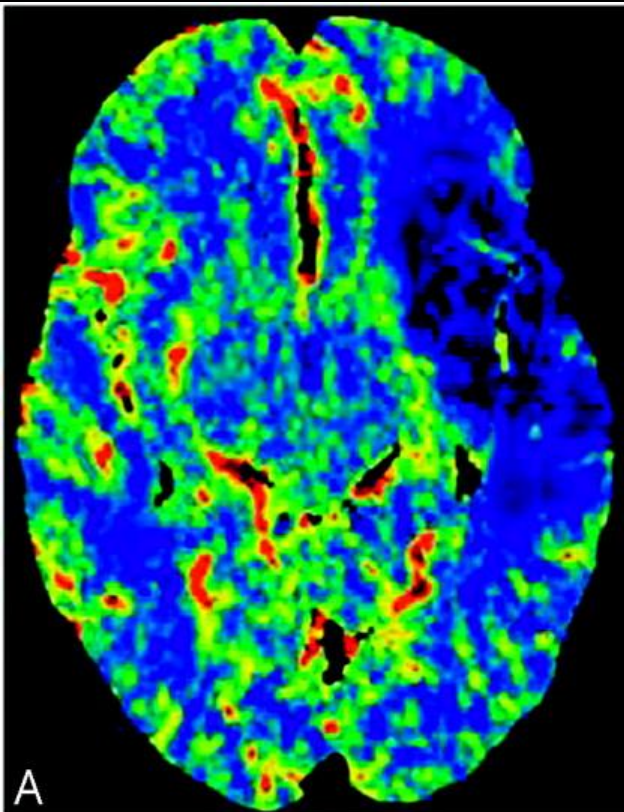
B: No, she has an amyloid angiopathy!

C: No - why have they found the old images?

D: No idea, I will ask my boss again!

E: No - why have I become a neurologist?

CT-Perfusion



Should IVT be given?

A: Of course – still a clear indication for IVT!

B: Yes, despite amyloid angiopathy the risk a severe handicap is high without IVT!

C: Direct mechanical thrombectomy without IVT!

D: No idea, why is my boss still not here???

E: No idea, I will become a psychiatrist...

What is new?

IVT is the standard
treatment for all AIS
patients within 4.5h
without contraindications

Paradigm shift from: « look for reasons not to thrombolyse »

Reasons to thrombolyse



Contraindications for IVT:

- minor neurological deficit or symptoms rapidly improving ...
- severe stroke as assessed clinically (e.g. NIHSS>25) ...
- seizure at onset of stroke ...
- patients with any history of prior stroke and concomitant diabetes
- prior stroke within the last 3 months
- platelet count of below 100,000/mm³
- systolic blood pressure > 185 or diastolic BP > 110 mm Hg, or aggressive management (intravenous pharmacotherapy) necessary to reduce BP to these limits
- blood glucose < 50 or > 400 mg/dl.
- (Actilyse is not indicated for the treatment of acute stroke in adults over 80 years of age)
- ...

Paradigm shift to: « Thrombolyse whenever possible »

Reasons to thrombolyse



IVT for
minor strokes

PRISMS

JAMA | Original Investigation

Effect of Alteplase vs Aspirin on Functional Outcome for Patients With Acute Ischemic Stroke and Minor Nondisabling Neurologic Deficits The PRISMS Randomized Clinical Trial

Pooja Khatri, MD, MSc; Dawn O. Kleindorfer, MD; Thomas Devlin, MD; Robert N. Sawyer Jr, MD; Matthew Starr, MD; Jennifer Mejilla, DO; Joseph Broderick, MD; Anjan Chatterjee, MD; Edward C. Jauch, MD, MS; Steven R. Levine, MD; Jose G. Romano, MD; Jeffrey L. Saver, MD; Achala Vagal, MD, MS; Barbara Purdon, PhD; Jenny Devenport, PhD; Andrey Pavlov, PhD; Sharon D. Yeatts, PhD; for the PRISMS Investigators

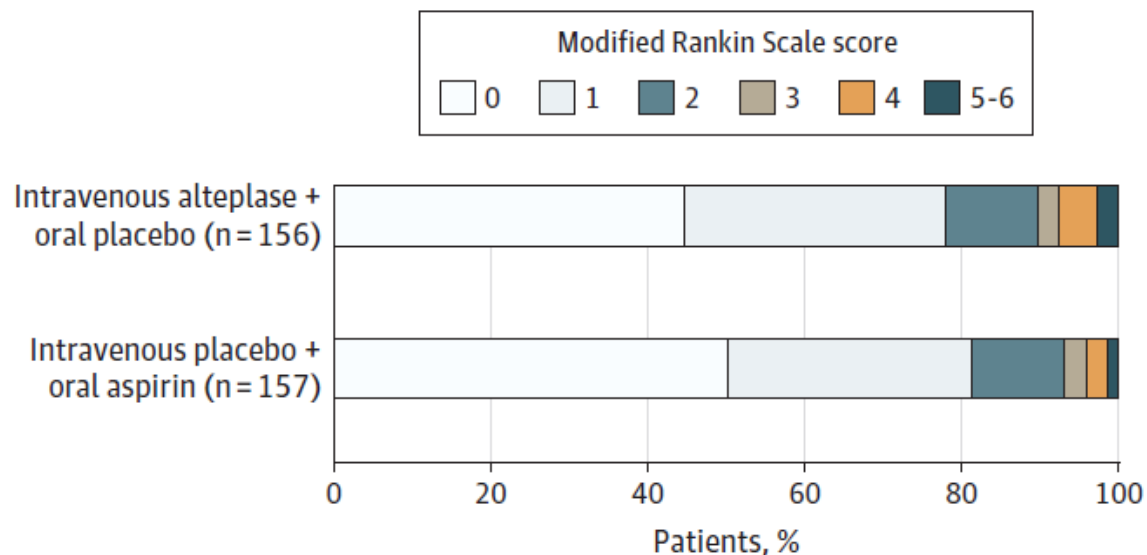
JAMA. 2018;320(2):156-166. doi:10.1001/jama.2018.8496

OBJECTIVE To evaluate the efficacy and safety of alteplase in patients with NIHSS scores of 0 to 5 whose deficits are not clearly disabling.

RESULTS Among 313 patients enrolled at 53 stroke networks (mean age, 62 [SD, 13] years; 144 [46%] women; median NIHSS score, 2 [interquartile range {IQR}, 1-3]; median time to treatment, 2.7 hours [IQR, 2.1-2.9]), 281 (89.8%) completed the trial. At 90 days, 122 patients (78.2%) in the alteplase group vs 128 (81.5%) in the aspirin group achieved a favorable outcome (adjusted risk difference, -1.1%; 95% CI, -9.4% to 7.3%). Five alteplase-treated patients (3.2%) vs 0 aspirin-treated patients had sICH (risk difference, 3.3%; 95% CI, 0.8%-7.4%).

CONCLUSIONS AND RELEVANCE Among patients with minor nondisabling acute ischemic stroke, treatment with alteplase vs aspirin did not increase the likelihood of favorable functional outcome at 90 days. However, the very early study termination precludes any definitive conclusions, and additional research may be warranted.

**Figure 2. Modified Rankin Scale Score Distributions at 90 Days
by Treatment Group**



These distributions, which were used for the primary outcome analysis, included imputation for missing 90-day scores.

IVT for
wake-up strokes?

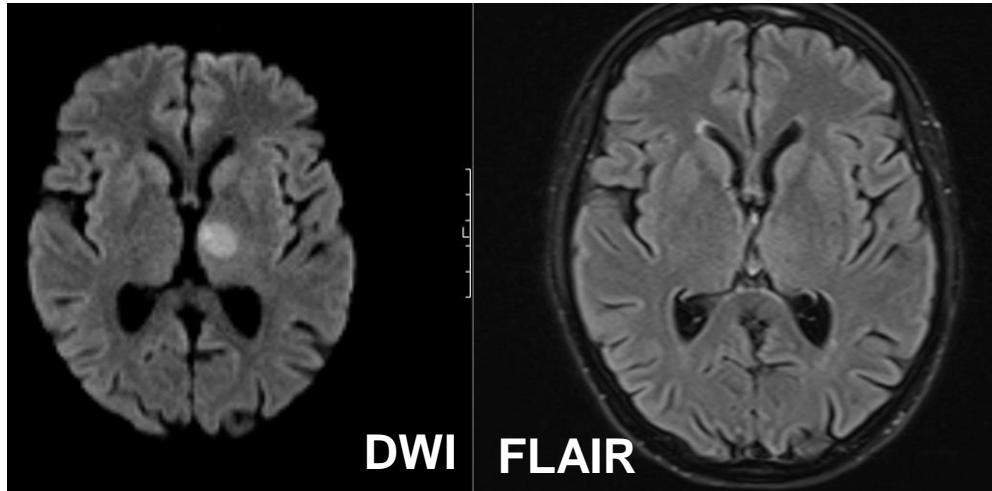
ORIGINAL ARTICLE

MRI-Guided Thrombolysis for Stroke with Unknown Time of Onset

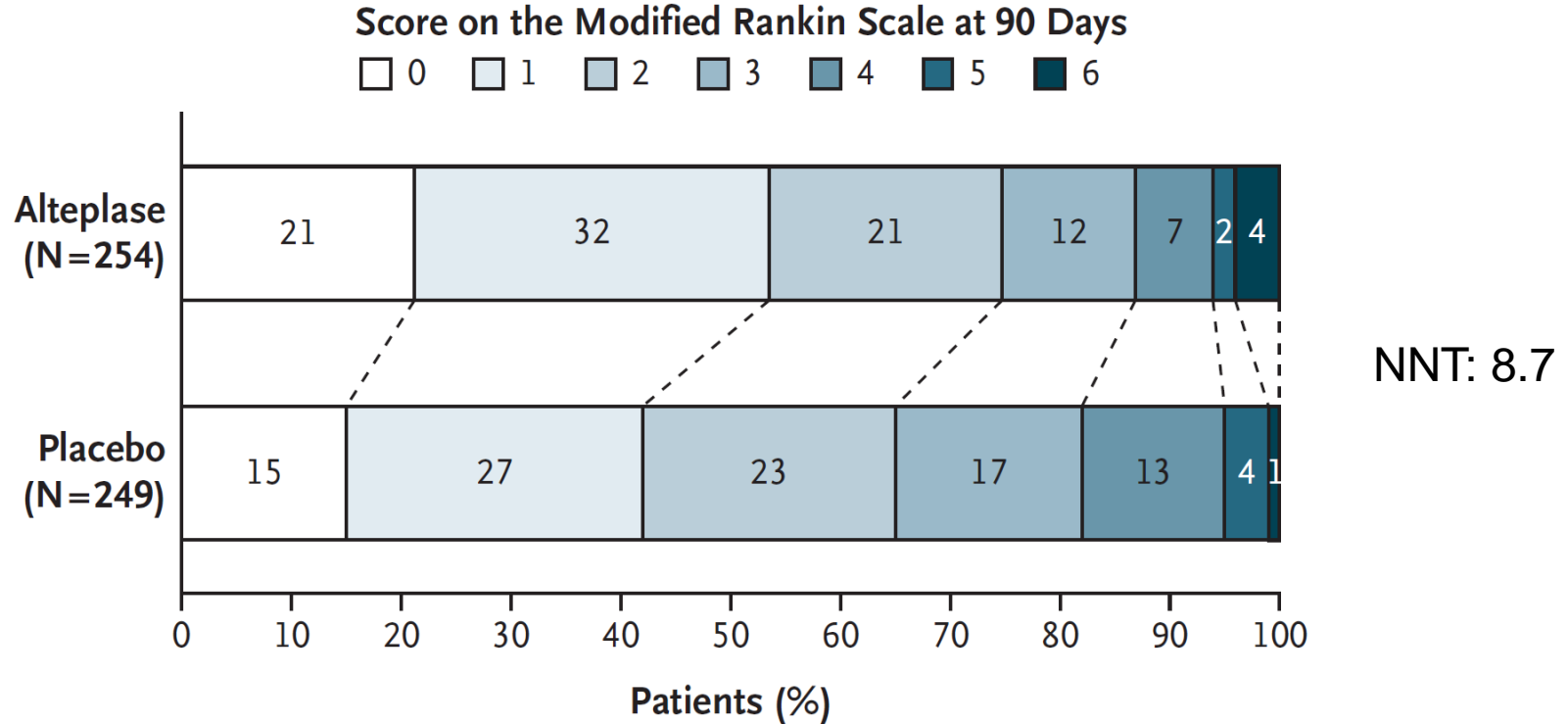
G. Thomalla, C.Z. Simonsen, F. Boutitie, G. Andersen, Y. Berthezene, B. Cheng, B. Cheripelli, T.-H. Cho, F. Fazekas, J. Fiehler, I. Ford, I. Galinovic, S. Gellissen, A. Golsari, J. Gregori, M. Günther, J. Guibernau, K.G. Häusler, M. Hennerici, A. Kemmling, J. Marstrand, B. Modrau, L. Neeb, N. Perez de la Ossa, J. Puig, P. Ringleb, P. Roy, E. Scheel, W. Schonewille, J. Serena, S. Sunaert, K. Villringer, A. Wouters, V. Thijs, M. Ebinger, M. Endres, J.B. Fiebach, R. Lemmens, K.W. Muir, N. Nighoghossian, S. Pedraza, and C. Gerloff, for the WAKE-UP Investigators*

WAKE-UP Trial

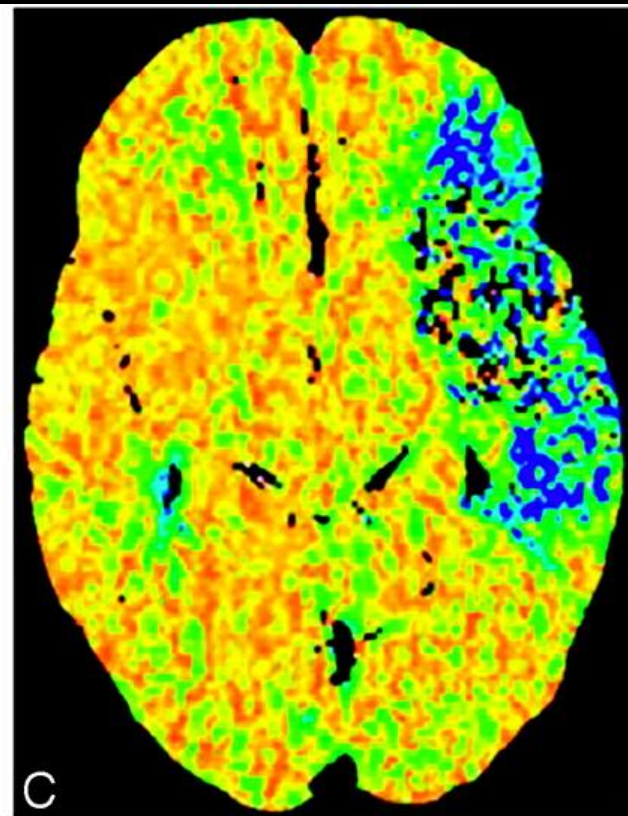
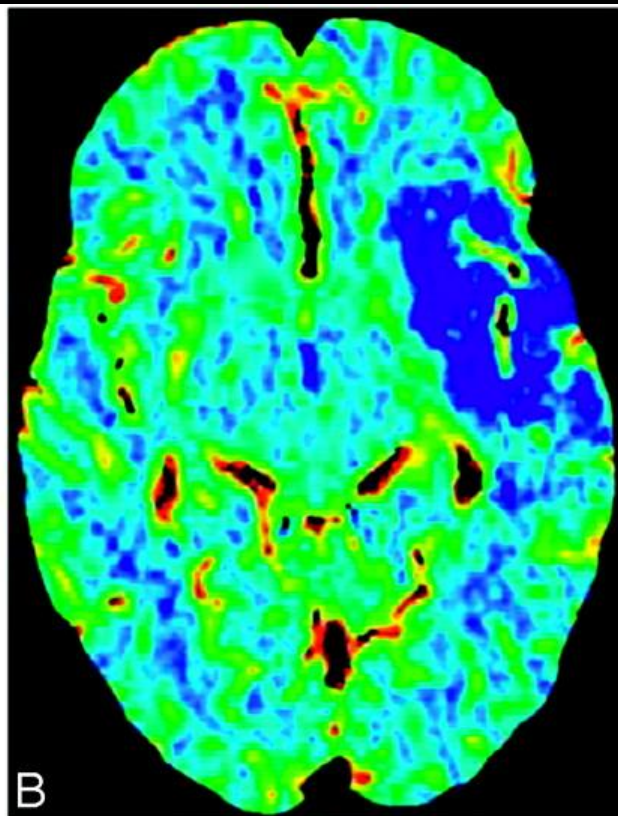
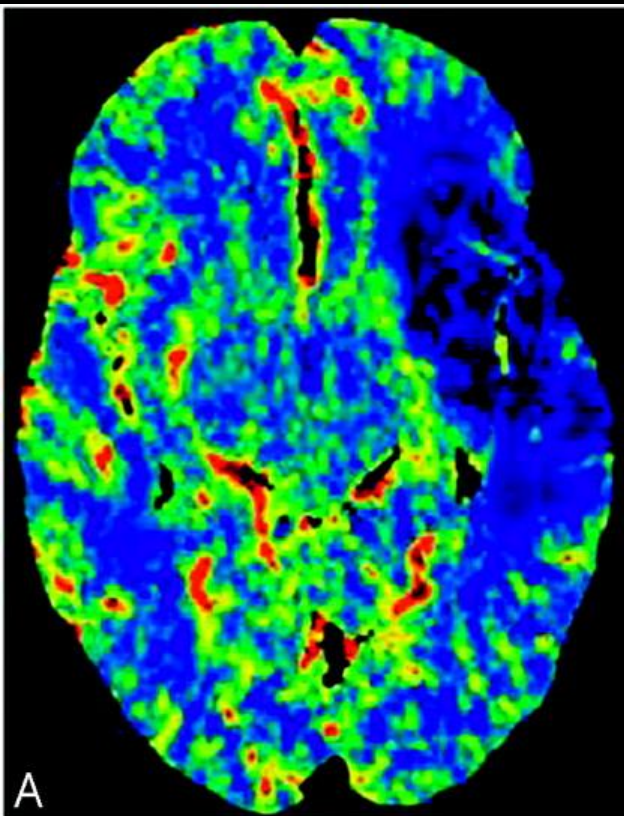
- 18-80 years
- Wake-up stroke or unknown time of symptom onset, NIHSS < 25
- «Time since last seen well» > 4.5h
- No large vessel occlusion
- MRI Diffusions-FLAIR mismatch



WAKE-UP Trial



Is IVT also safe and
efficacious 4.5 - 9 hours
after symptom onset?



The NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

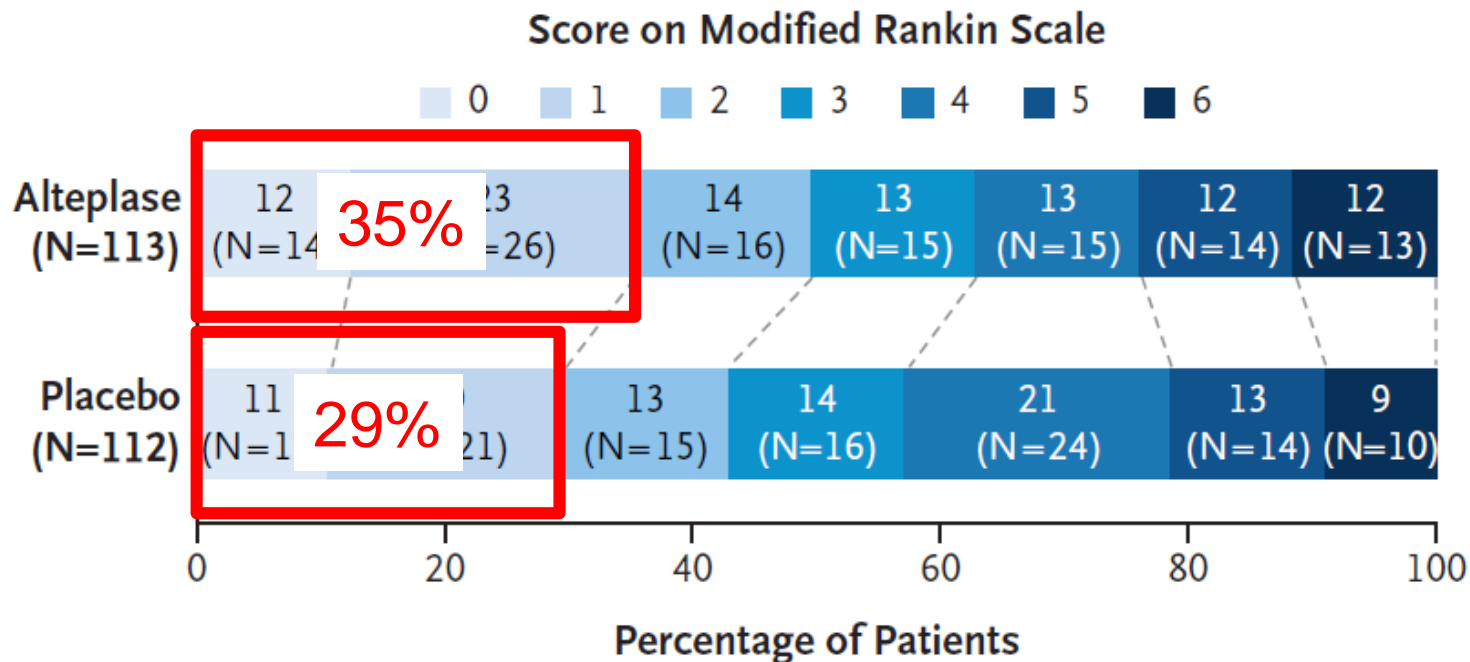
MAY 9, 2019

VOL. 380 NO. 19

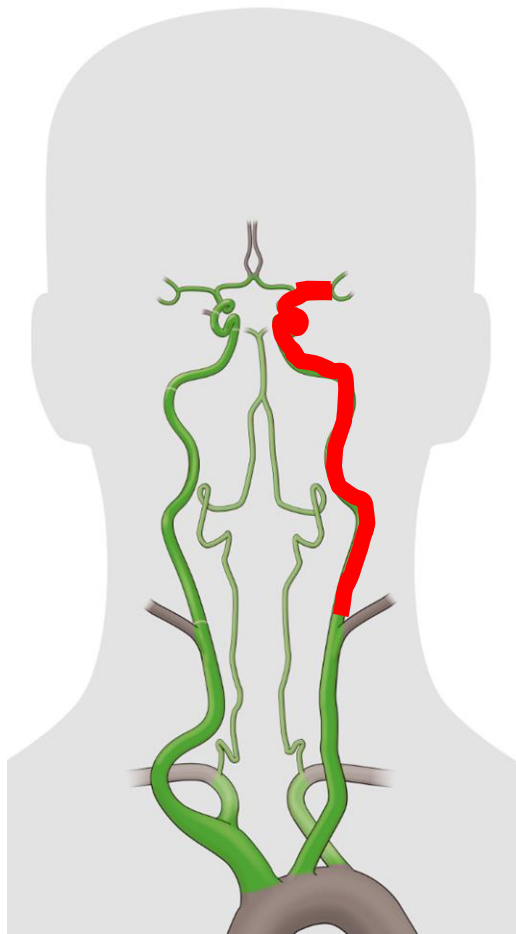
Thrombolysis Guided by Perfusion Imaging up to 9 Hours after Onset of Stroke

H. Ma, B.C.V. Campbell, M.W. Parsons, L. Churilov, C.R. Levi, C. Hsu, T.J. Kleinig, T. Wijeratne, S. Curtze, H.M. Dewey, F. Miteff, C.-H. Tsai, J.-T. Lee, T.G. Phan, N. Mahant, M.-C. Sun, M. Krause, J. Sturm, R. Grimley, C.-H. Chen, C.-J. Hu, A.A. Wong, D. Field, Y. Sun, P.A. Barber, A. Sabet, J. Jannes, J.-S. Jeng, B. Clissold, R. Markus, C.-H. Lin, L.-M. Lien, C.F. Bladin, S. Christensen, N. Yassi, G. Sharma, A. Bivard, P.M. Desmond, B. Yan, P.J. Mitchell, V. Thijs, L. Carey, A. Meretoja, S.M. Davis, and G.A. Donnan, for the EXTEND Investigators*

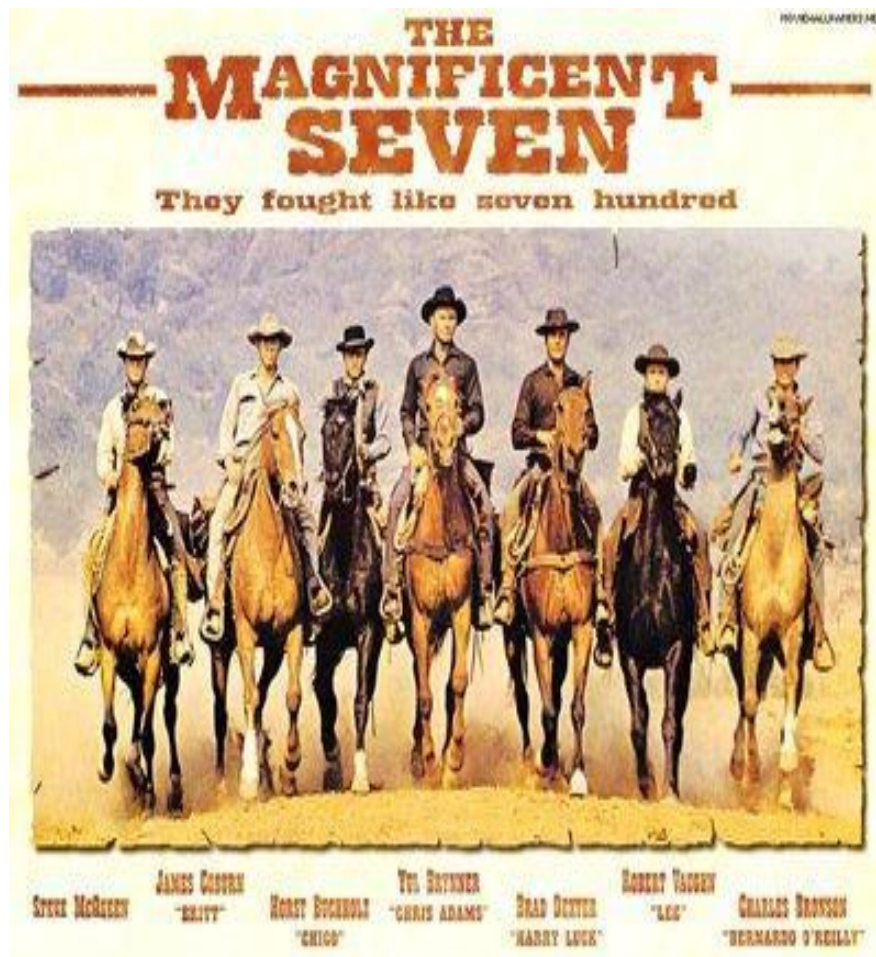
EXTEND



Endovascular stroke treatment



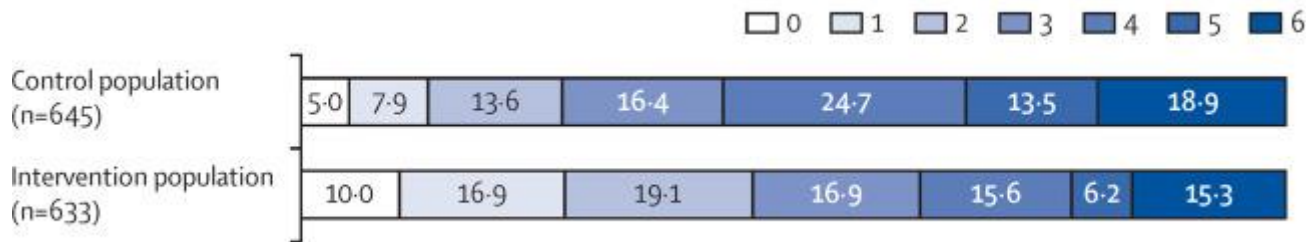
2014 / 2015
MR CLEAN
ESCAPE
EXTEND-IA
SWIFT PRIME
REVASCAT
THRACE
THERAPY



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

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

A Overall

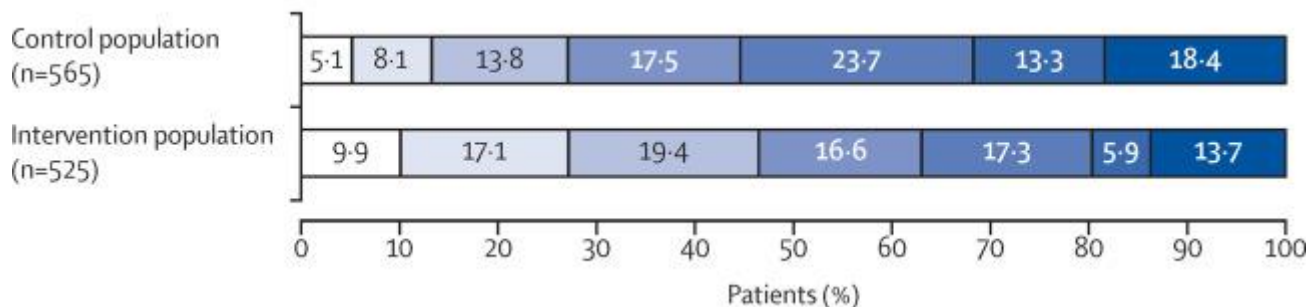


B

Ineligible for alteplase



Received alteplase



NNT
1667
217
100
25
16
2.5

NNT	Treatment
1667	ASS daily in healthy people to prevent stroke or heart attack
217	CT lung cancer screening in high-risk smokers to prevent one death
100	Bloods pressure medication to prevent one heart attack
25	Warfarin in Afib to prevent one stroke
16	Antibiotics to prevent infection with a broken bone that pierces the skin
2.5	Defibrillation for cardiac arrest to prevent death during CPR

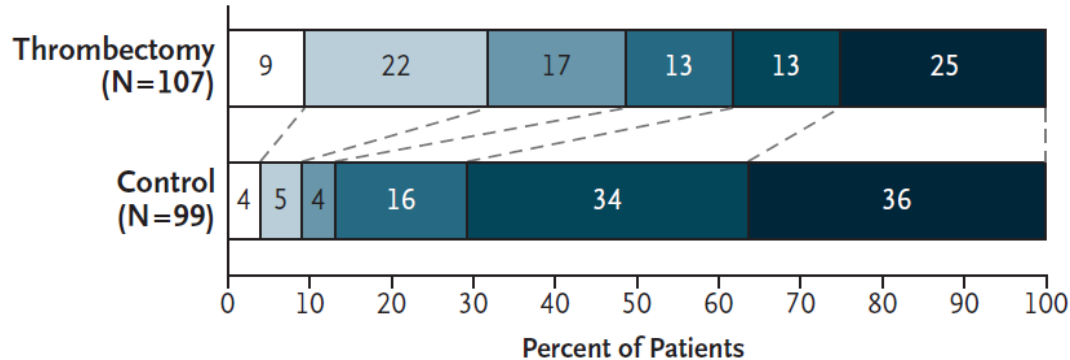
EVT after 6 hours?

DAWN trial

ICA/M1 occlusion

6-24h after symptom onset

Mismatch clinical deficit – infarct core (i.e.. >10 und <21ml)



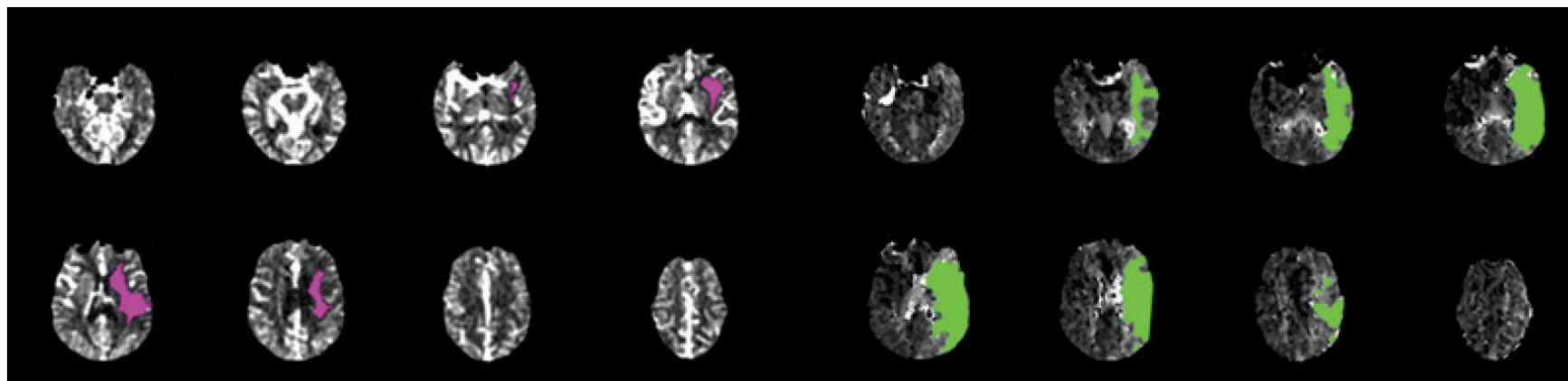
NNT 2.8 for functional independence (mRS 0-2)

DEFUSE 3 trial

ICA/M1 occlusion

6-16h after symptom onset

Infarct core <15ml, Penumbra >70ml



Volume of Ischemic Core, 23 ml

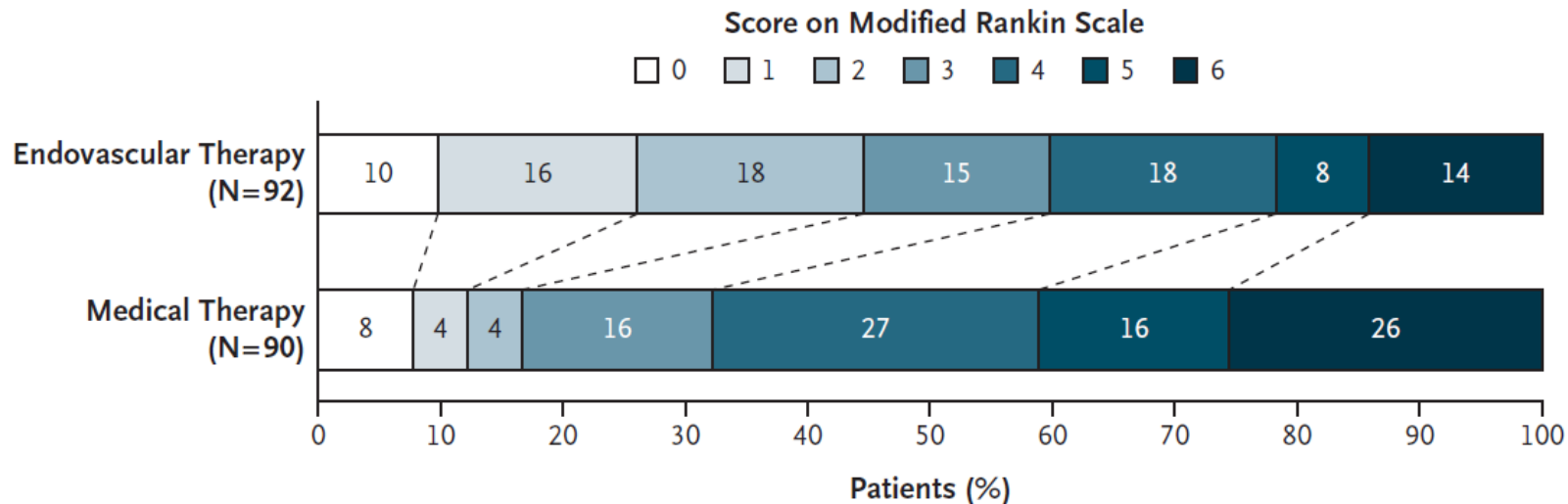
Volume of Perfusion Lesion, 128 ml

DEFUSE 3 trial

ICA/M1 occlusion

6-16h after symptom onset

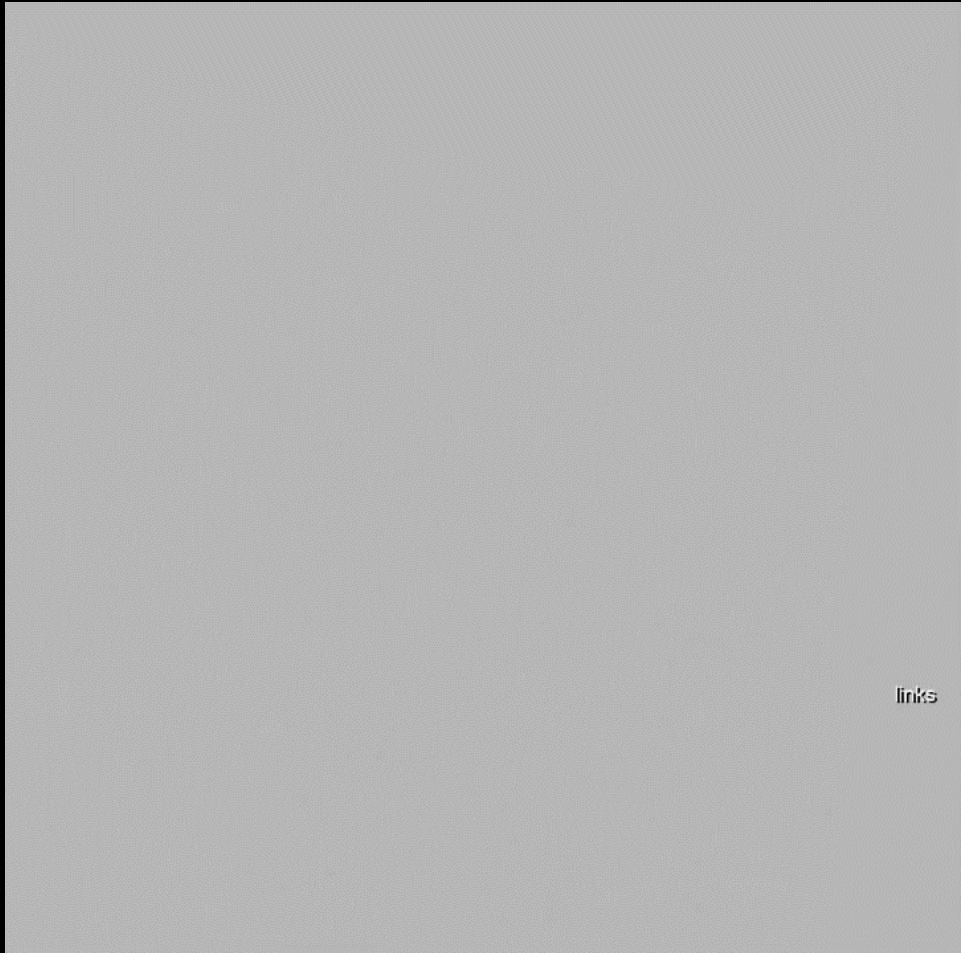
Infarct core <15ml, Penumbra >70ml

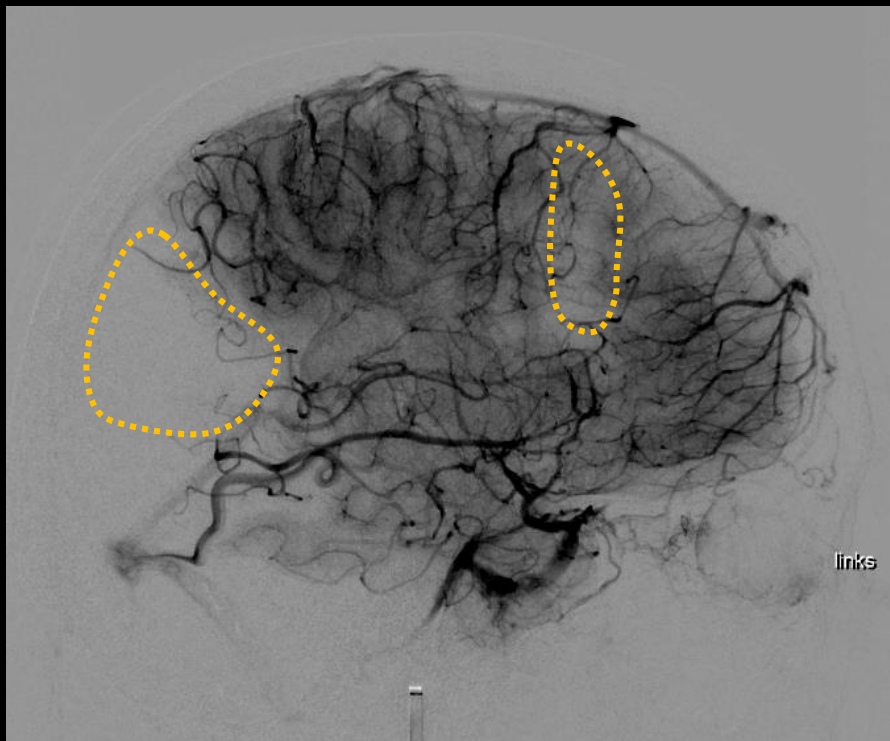




Unanswered Questions

The next
challenges?





65 Minuten after thrombolysis

3h after symptom onset

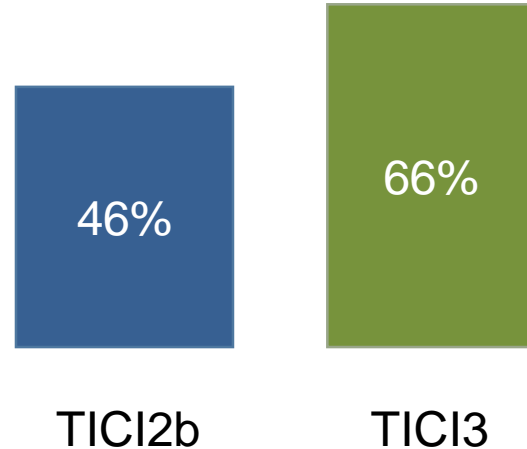
Impact of incomplete
reperfusion on
outcome?

RESEARCH PAPER

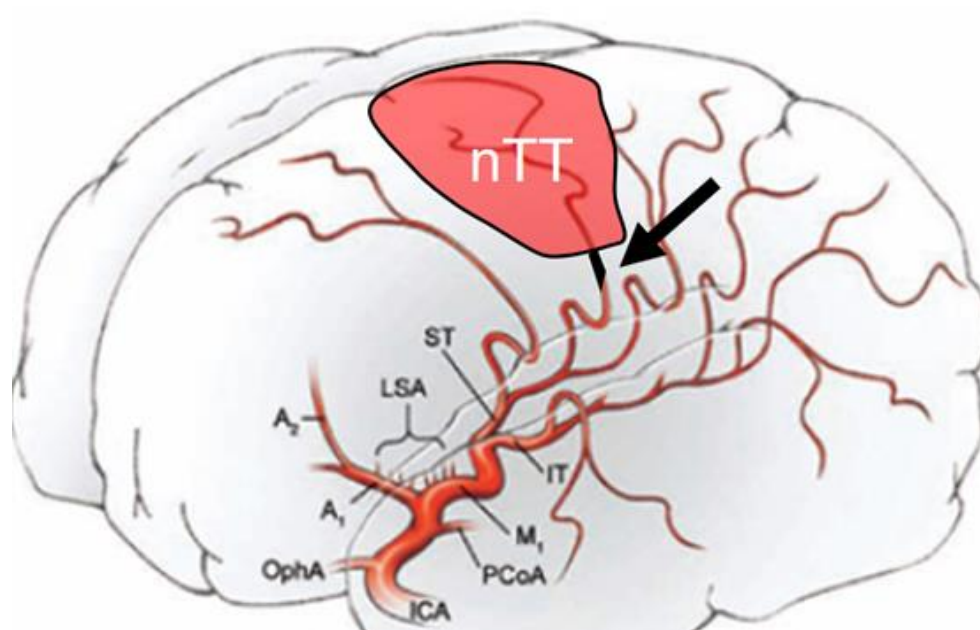
Systematic review and meta-analysis on outcome differences among patients with TICI2b versus TICI3 reperfusions: success revisited

Johannes Kaesmacher,¹ Tomas Dobrocky,¹ Mirjam R Heldner,² Sebastian Bellwald,² Pascal J Mosimann,¹ Pasquale Mordasini,¹ Sandra Bigi,³ Marcel Arnold,² Jan Gralla,¹ Urs Fischer²

mRS 0-2



Intraarterial thrombolysis
for incomplete
reperfusion?

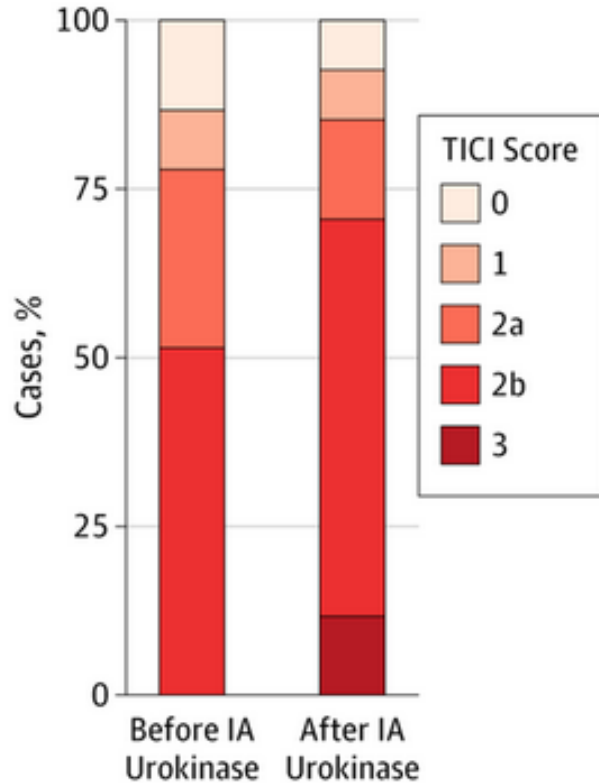


JAMA Neurology | **Original Investigation**

Safety and Efficacy of Intra-arterial Urokinase After Failed, Unsuccessful, or Incomplete Mechanical Thrombectomy in Anterior Circulation Large-Vessel Occlusion Stroke

Johannes Kaesmacher, MD; Sebastian Bellwald, MD; Tomas Dobrocky, MD; Thomas R. Meinel, MD; Eike I. Piechowiak, MD; Martina Goeldlin, MD; Christoph C. Kurmann, MD; Mirjam R. Heldner, MD; Simon Jung, MD; Pasquale Mordasini, MD; Marcel Arnold, MD; Pascal J. Mosimann, MD; Gerhard Schroth, MD; Heinrich P. Mattle, MD; Jan Gralla, MD, MSc; Urs Fischer, MD, MSc

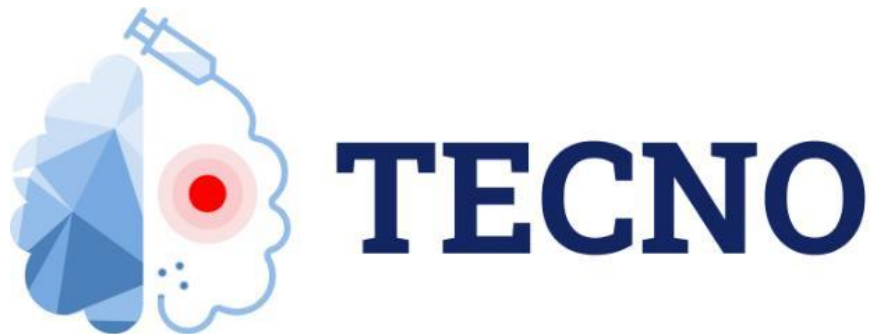
A TICI score shift



IAT has an impact
on reperfusion!

Kaesmacher J, ... Fischer U. JAMA Neurol.

TECNO!



Safety and Efficacy of intra-arterial **TE**ne**C**teplase for **N**on-complete reperfusion of intracranial **O**cclusions

PD Johannes Kaesmacher und Prof. Urs Fischer



FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Further
challenges?

62 male



NIHSS 12



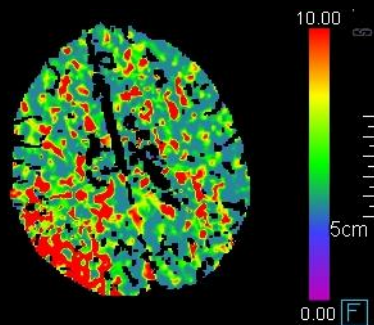
Wake-up



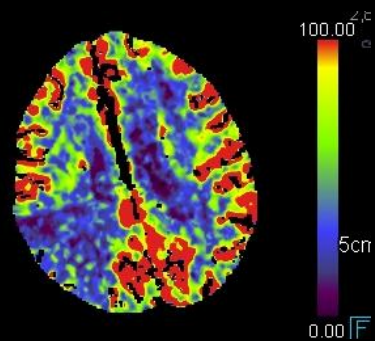
62 jähriger Mann

NIHSS 12

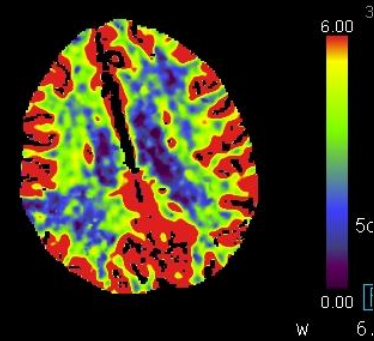
Wake-up



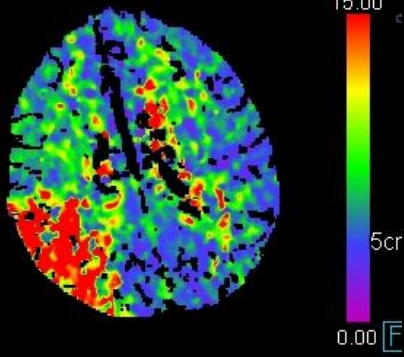
MTT



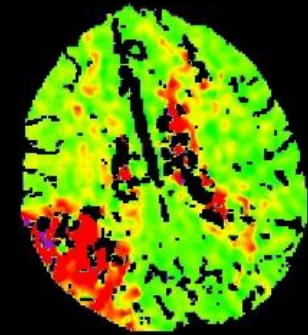
CBF



CBV

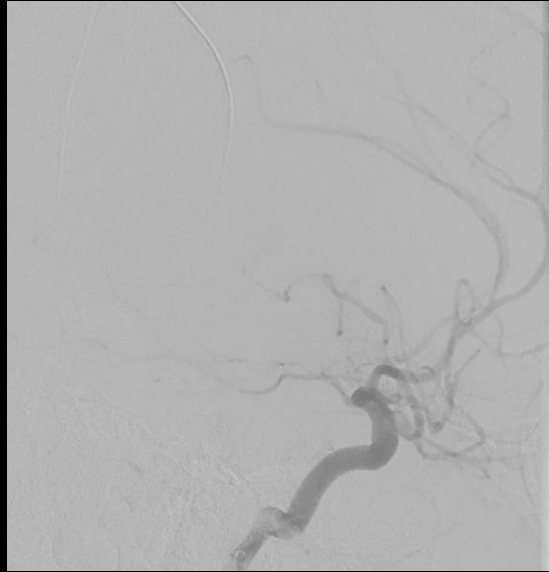


TTD



TTP

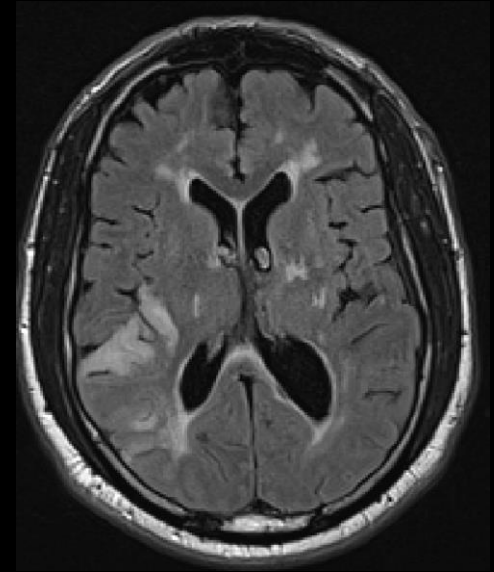
M2



TICI3



NIHSS 6



20 – 40% of patients affected!

DISTAL!

EnDovascular therapy plus best medical treatment (BMT) versus BMT alone for Medium VeSsel Occlusion sTroke

-

a prAgmatic, international, multicentre,
randomized trial **(DISTAL)**

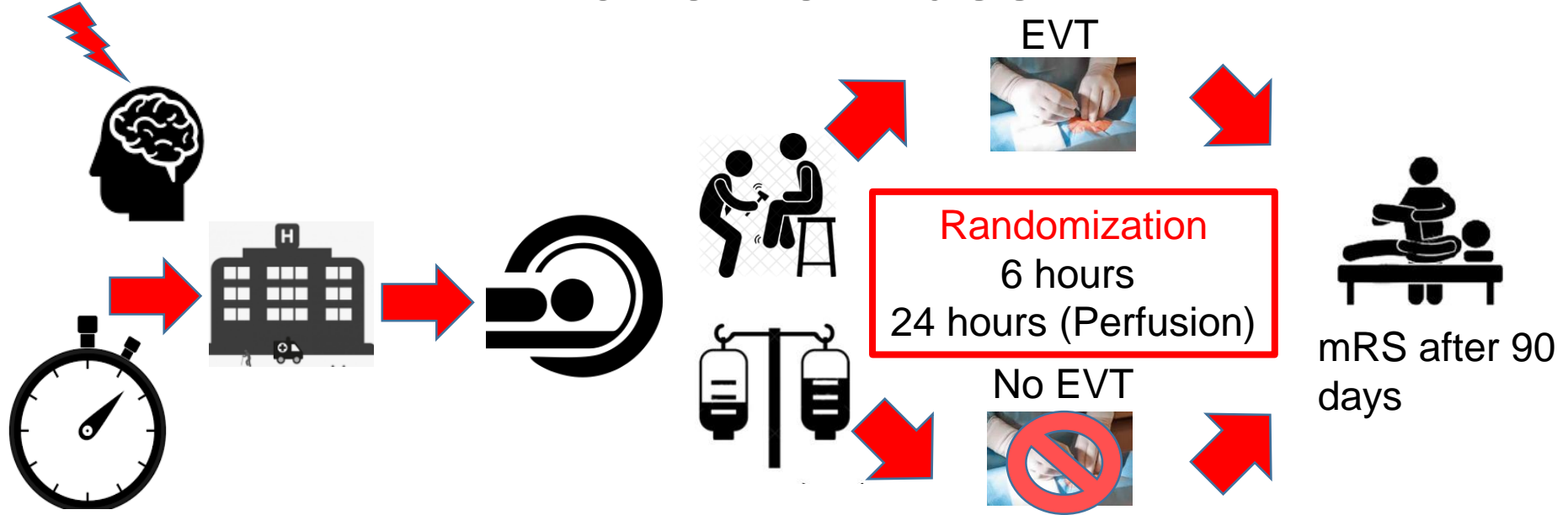
NCT05029414

Prof. Marios-Nikos Psychogios und Prof. Urs Fischer

Länder und Zentren



Patientenfluss



- Informed Consent/independent physician
- Isolated Medium Vessel Occlusion
- NIHSS ≥ 4 (or symptoms clearly disabling)
- Age ≥ 18 years



«Mit dieser internationalen, vom USB geleiteten Studie, werden wir zeigen können, ob die endovaskuläre Hirnschlagbehandlung das Schicksal von Patientinnen und Patienten mit einem Verschluss einer mittelgrossen Hirnschlagarterie verbessert.»

Prof. Marios Psychogios, Abteilungsleiter diagnostische und interventionelle Neuroradiologie am Universitätsspital Basel und DKF Forschungsgruppenleiter

DISTAL-Studie

DISTAL ist eine internationale multizentrische Studie, welche die endovaskuläre Behandlung von Verschlüssen mittelgrosser Hirnarterien bei Hirnschlagpatientinnen und -patienten untersucht. Die Daten werden die Basis für zukünftige Therapie-Richtlinien liefern. Im Zentrum des Interesses steht dabei die Reduktion von Behinderung und Abhängigkeit der Hirnschlagbetroffenen. Durch die erfolgreiche Eingabe der DISTAL-Studie in das Investigator-Initiated Clinical Trials (IICT)-Programm des Schweizerischen Nationalfonds wird das Projekt über fünf Jahre finanziert. Das IICT-Programm unterstützt Studien, welche einen aus medizinischer sowie gesellschaftlicher Sicht ungedeckten Bedarf darstellen, aber nicht im Fokus der Industrie stehen.

DISTAL

Endovascular therapy plus best medical treatment (BMT) versus BMT alone for Medium Vessel Occlusion sTroke – a pragmatic, international, multicentre, randomized trial.

Studienzentren

Insgesamt 40-50 in der Schweiz, Deutschland, Belgien, Portugal, Spanien, Finnland und Israel

Patientinnen

Derzeit 5
Geplant 526

Projektdauer

2021-2026

Funding

SNF IICT

Leitung

Prof. Marios-Nikos Psychogios
Prof. Urs Fischer
Universitätsspital Basel

Studienmethodik

Internationale, multizentrische, pragmatische, randomisierte klinische Studie

DKF Services

Data Management
Methodische Beratung
Monitoring
Projektmanagement
Regulatorik
Statistik



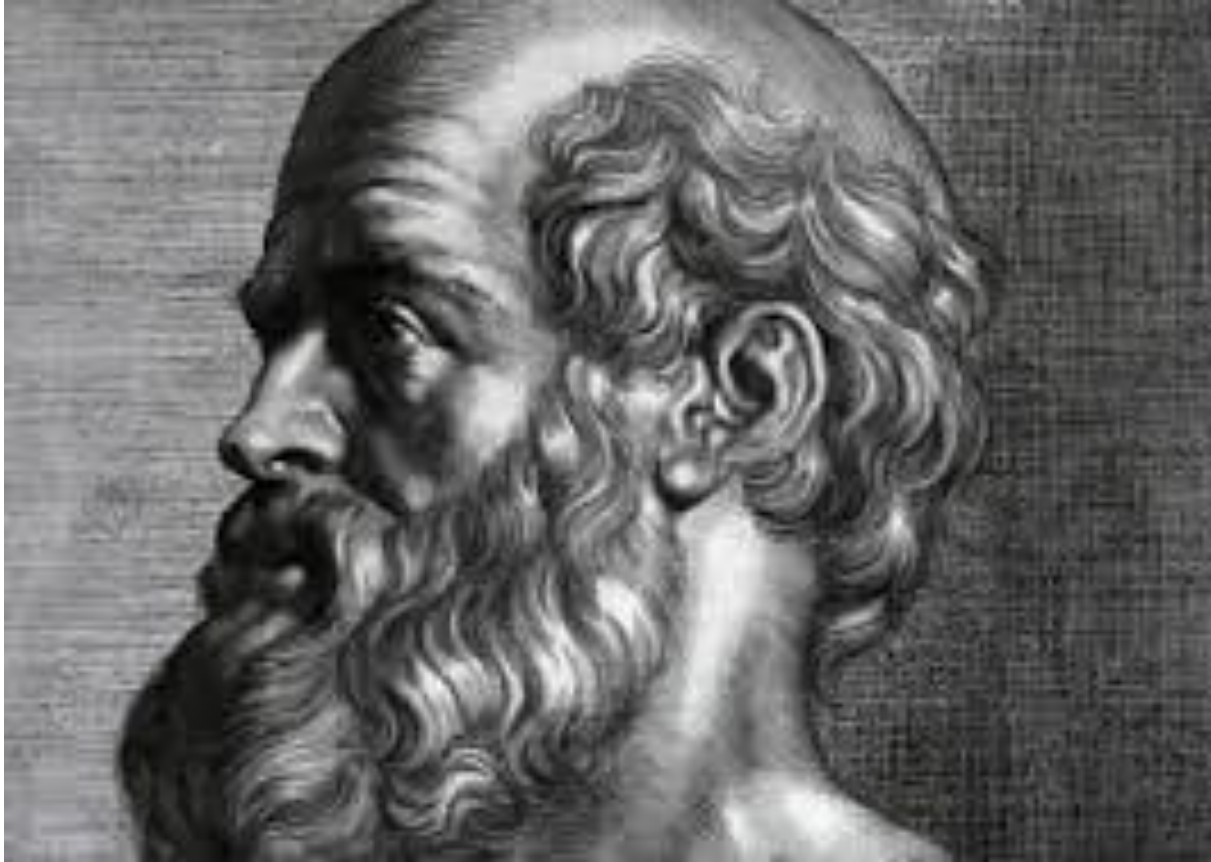
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Secondary prevention





“Prevention is better than cure”



Hippocrates

Stroke can
be prevented!

Primary prevention

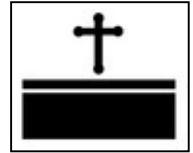
Modifiable risk factors responsible for disability-adjusted life-years

Globally

- ◆ Blood pressure
- ◆ Smoking
- ◆ BMI
- ◆ Childhood undernutrition
- ◆ Fasting plasma glucose
- ◆ Alcohol use
- ◆ Household air pollution
- ◆ Unsafe water
- ◆ Unsafe sex
- ◆ Fruit

Developed countries

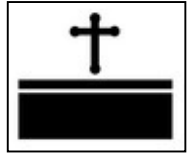
- ◆ Blood pressure
- ◆ BMI
- ◆ Smoking
- ◆ Alcohol use
- ◆ Fasting plasma glucose
- ◆ Total cholesterol
- ◆ Glomerular filtration
- ◆ Sodium
- ◆ Physical activity
- ◆ Fruits



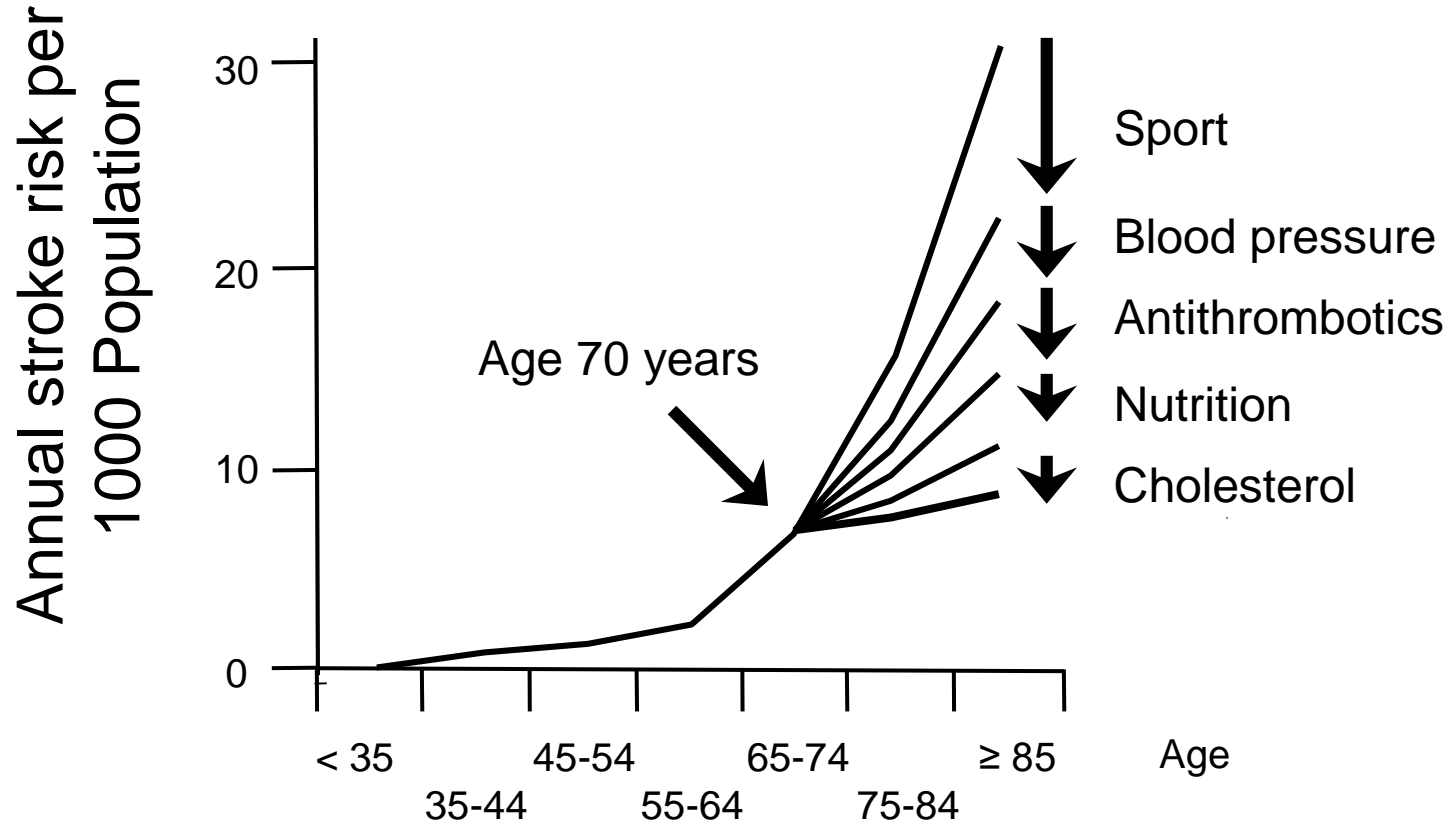
Modifiable risk factors responsible for stroke

In each region of the world, these 10 modifiable risk factors explain 90% of strokes :

- ◆ Hypertension
- ◆ Current smoking
- ◆ Waist-hip-ratio
- ◆ Physical inactivity
- ◆ Unhealthy diet (incl. Sodium)
- ◆ Alcohol intake
- ◆ Lipids (apolipoproteins B/A1)
- ◆ Diabetes / \uparrow HbA1c / \uparrow FPG
- ◆ Psychosocial factors
- ◆ Cardiac causes (incl. AF)



What can we achieve?



Secondary prevention



Conclusion

- TIA is an emergency!
- Aetiology matters – rapid investigation is important.
- Patient selection: stroke unit versus stroke center
- IVT is efficacious for occlusion of smaller vessels
- EVT is efficacious for large vessel occlusions
- Future challenges: incomplete reperfusion and distal vessel occlusion
- Prevention is crucial!

Many thanks for your attention!

