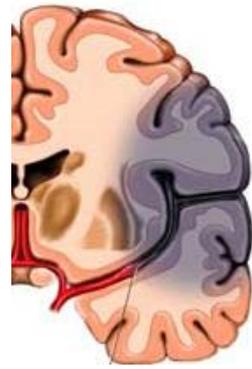




ICCA STROKE 2019



Moving Towards Multispecialty Ischaemic Stroke Management in Poland: Pathways and Challenges for Cardiology/Angiology

Piotr Musiałek

ESC Research Committee & Congress Programme Committee

Polish Cardiac Society Board Representative - Stroke and Vascular Interventions



Jagiellonian University Dept. of Cardiac & Vascular Diseases
John Paul II Hospital, Kraków, Poland



DISCLOSURE STATEMENT OF FINANCIAL INTEREST

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below

AFFILIATION/FINANCIAL RELATIONSHIP

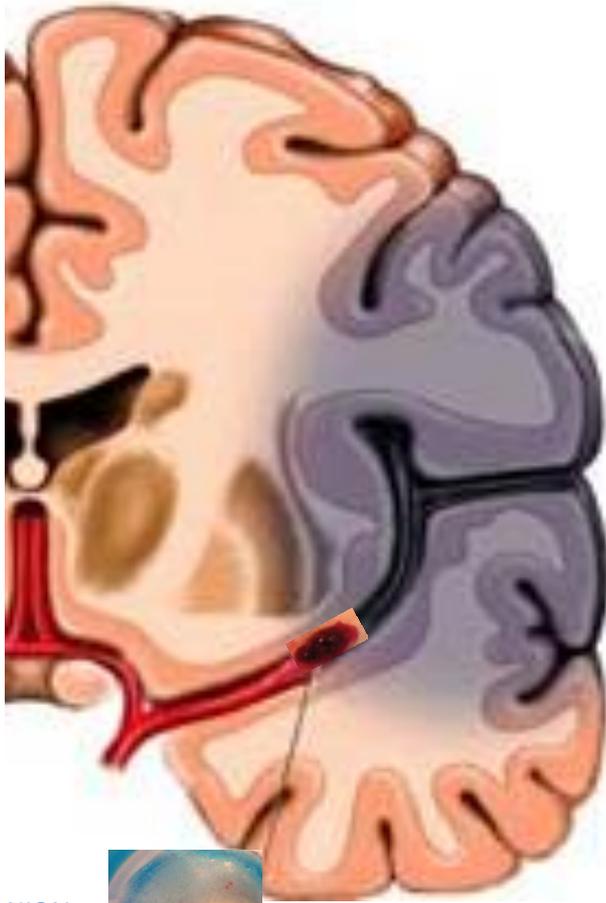
- Grant/Research Support
- Consulting Fees/Honoraria
- Major Stock Shareholder/Equity
- Royalty Income
- Ownership/Founder
- Intellectual Property Rights
- Other Financial Benefit

COMPANY

- Abbott
- Abbott, InspireMD, Medtronic
- No
- No
- No
- No
- No

Epidemiology report: trends in sex-specific cerebrovascular disease mortality in Europe based on WHO mortality data

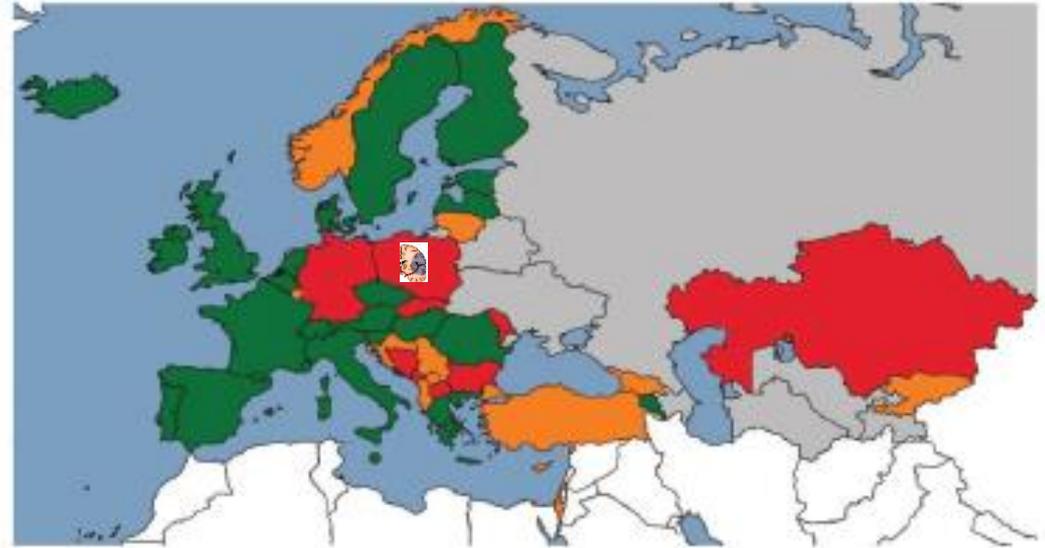
Rushabh Shah¹, Elizabeth Wilkins¹, Melanie Nichols², Paul Kelly³, Farah El-Sadi¹, F. Lucy Wright⁴, and Nick Townsend^{1,5*}



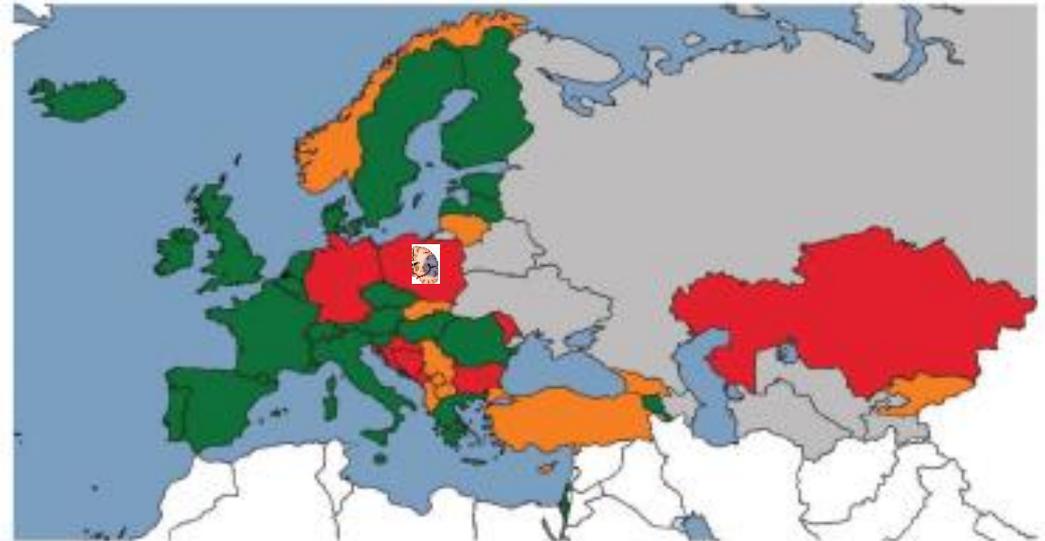
MECHANICAL THROMBECTOMY



Females



Males

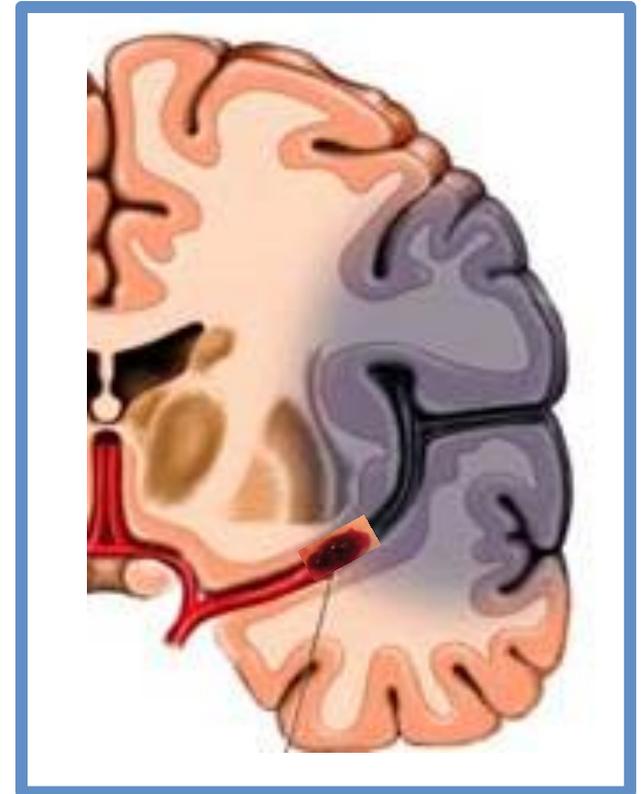


Key*

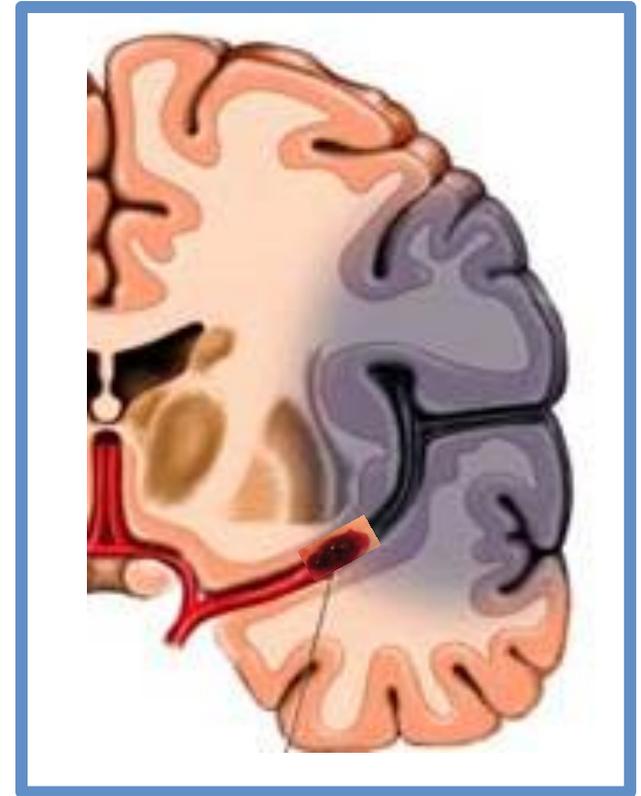
	Significant decrease		Significant increase
	No significant change		No data available

Ischaemic Stroke Volume

Poland: **60 000 – 70 000 / year**



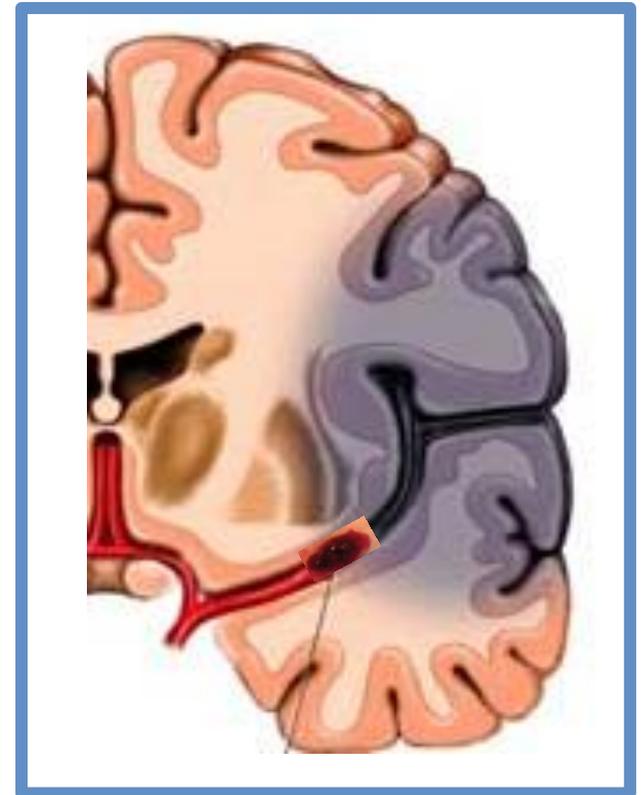
Ischaemic Stroke Volume
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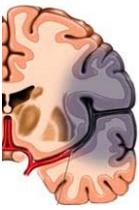
VASCULAR DISEASE OF THE BRAIN

Ischaemic Stroke Volume
Poland: **60 000 – 70 000 / year**

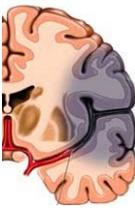
#1
CAUSE OF
DISABILITY



VASCULAR DISEASE OF THE BRAIN

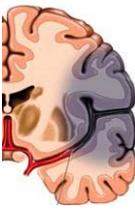


**(any)
*ineffective/
suboptimal*
stroke
management
system**



**(any)
*ineffective/
suboptimal*
stroke
management
system**

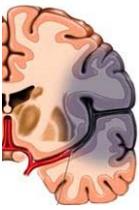
=



(any)
*ineffective/
suboptimal*
stroke
management
system

=

systematic,
effective
PRODUCTION
of
THE DISABLED
("invalids")

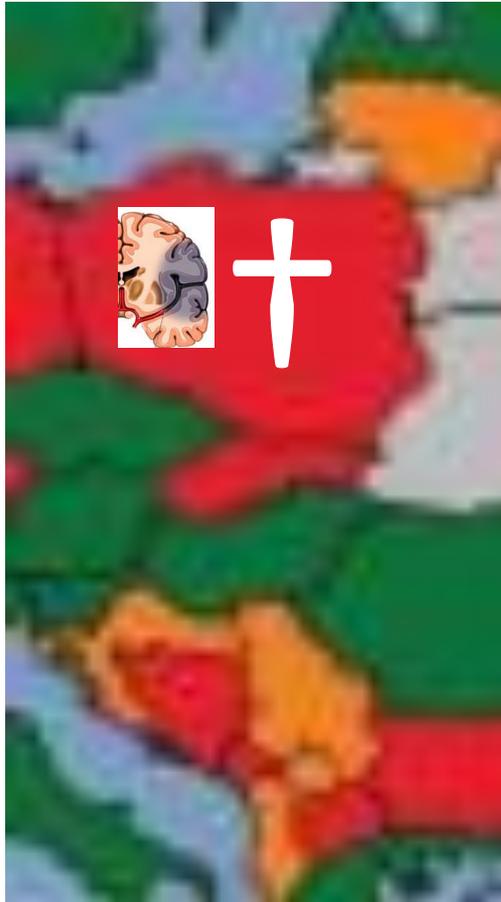


(any)
*ineffective/
suboptimal*
stroke
management
system

=



Map of trends in ischaemic stroke age-standardized mortality rates, Europe 1980–2016



Significant decrease	Significant increase
No significant change	No data available

Map of trends in ischaemic stroke age-standardized mortality rates, Europe 1980–2016



Significant decrease	Significant increase
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Map of trends in ischaemic stroke age-standardized mortality rates, Europe 1980–2016



Significant decrease	Significant increase
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Long-Term Outcome in the North East Melbourne Stroke Incidence Study



Predictors of Quality of Life at 5 Years After Stroke

Seana L. Paul, BSc (Hons); Jonathan W. Sturm, PhD; Helen M. Dewey, PhD;
Geoffrey A. Donnan, MD; Richard A.L. Macdonell, MD; Amanda G. Thrift, PhD

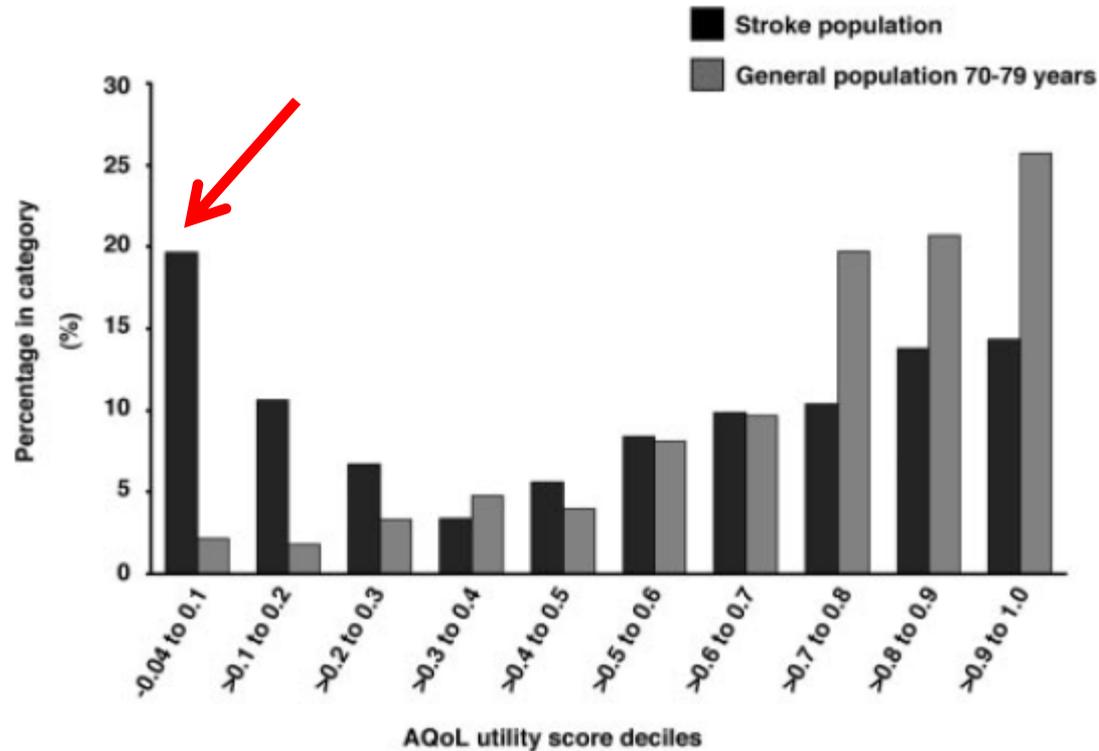


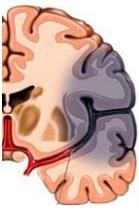
Figure 1. Distribution of AQoL utility scores among 5-year survivors and Australian general population aged 70–79 years.

Utility scores range from -0.04 (state worse than death) through 0.0 (death-equivalent) to 1.0 (full health). The AQoL is valid and reliable in stroke patients.²⁷

Why "multispecialty/multidisciplinary" task ?



Why "multispecialty/multidisciplinary" task ?



- 1. because the disease is multispecialty**

Why "multispecialty/multidisciplinary" task ?



- 1. because the disease is multispecialty**
- 2. because those who say "yes – we can do it"**

Why "multispecialty/multidisciplinary" task ?



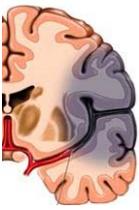
- 1. because the disease is multispecialty**
- 2. because those who say "yes – we can do it"
("*no others needed*")**

Why "multispecialty/multidisciplinary" task ?



1. because the disease is multispecialty
 2. because those who say "yes – we can do it"
(*"no others needed"*)
- are NOT ENOUGH!**

The disease is **MULTISPECIALTY**



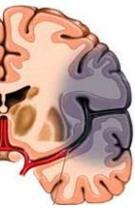
- **pathophysiology**

The disease is **MULTISPECIALTY**



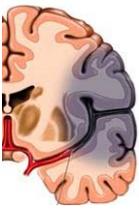
- **pathophysiology**
- **scale of the problem**

The disease is **MULTISPECIALTY**



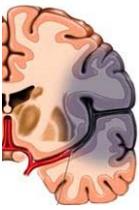
- **pathophysiology**
- **scale of the problem**
- **organization/logistics**

The disease is **MULTISPECIALTY**



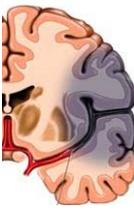
- **pathophysiology**
- **scale of the problem**
- **organization/logistics**
- ***endovascular skills***

The disease is **MULTISPECIALTY**



- **pathophysiology**
- **scale of the problem**
- **organization/logistics**
- ***endovascular skills***
- ***mindset (24/7/365)***

The disease is **MULTISPECIALTY**



- **pathophysiology**
- **scale of the problem**
- **organization/logistics**
- ***endovascular skills***
- ***mindset*** (24/7/365)
- **prevention (primary, secondary)**

AHA Statistical Update



Table 14-2. Modifiable Stroke Risk Factors

Factor	Prevalence, %	PAR, %*	RR
Cigarette smoking			
Overall	19.8	12–14†	1.9
Men	22.3		
Women	17.4		
Hypertension		‡	8
Ages 20–34 y			
Men	13.4	99	
Women	6.2	98	
Ages 35–44 y			
Men	23.2	99	
Women	16.5	106	
Ages 45–54 y			
Men	36.2	100	
Women	35.9	103	
Ages 55–64 y			
Men	53.7	100	
Women	55.8	102	
Ages 65–74 y			
Men	64.7	100	
Women	69.6	101	
Ages ≥75 y			
Men	64.1	100	
Women	76.4	101	
Diabetes mellitus	7.3	5–27	1.8–6.0
High total cholesterol	Data calculated for highest quintile (20%) vs lowest quintile	9.1 (5.7–13.8)	1.5 (95% CI, 1.3–1.8)
	Continuous risk for ischemic stroke	...	1.25 per 1-mmol/L (38.7 mg/dL) increase
→ AF (nonvalvular)			
50–59	0.5	1.5	4.0
60–69	1.8	2.8	2.6
70–79	4.8	9.9	3.3
80–89	8.8	23.5	4.5
→ Asymptomatic carotid stenosis	2–8	2–7§	2.0

Risk of ischaemic stroke according to pattern of atrial fibrillation: analysis of 6563 aspirin-treated patients in ACTIVE-A and AVERROES

Thomas Vanassche^{1*}, Mandy N. Lauw¹, John W. Eikelboom¹, Jeff S. Healey¹, Robert G. Hart¹, Marco Alings², Alvaro Avezum³, Rafael Díaz⁴, Stefan H. Hohnloser⁵, Basil S. Lewis⁶, Olga Shestakovska¹, Jia Wang¹, and Stuart J. Connolly¹

¹Population Health Research Institute, McMaster University and Hamilton Health Sciences, 237 Barton St. E., Hamilton, ON, Canada L8L 2X2; ²Amphia Ziekenhuis, Breda, The Netherlands; ³Instituto Dante Pazzanese de Cardiologia, São Paulo, Brazil; ⁴Estudios Clínicos Latinoamérica, Rosario, Argentina; ⁵Department of Cardiology, Johann-Wolfgang-Goethe-Universität, Frankfurt, Germany; and ⁶Cardiovascular Clinical Research Institute, Lady Davis Carmel Medical Center and the Ruth and Bruce Rappaport School of Medicine, Technion-IIT, Haifa, Israel

Received 21 April 2014; revised 20 June 2014; accepted 16 July 2014; online publish-ahead-of-print 3 September 2014

Aims

The pattern of atrial fibrillation (AF) occurrence—paroxysmal, persistent, or permanent—is associated with progressive stages of atrial dysfunction and structural changes and may therefore be associated with progressively higher stroke risk. However, previous studies have not consistently shown AF pattern to predict stroke but have been hampered by methodological shortcomings of low power, variable event ascertainment, and variable anticoagulant use.

Methods and results

We analysed the rates of stroke and systemic embolism in 6563 aspirin-treated patients with AF from the ACTIVE-A/AVERROES databases. There was thorough searching for events and adjudication. Multivariable analyses were performed with the adjustment for known risk factors for stroke. Mean age of patients with paroxysmal, persistent, and permanent AF was 69.0 ± 9.9 , 68.6 ± 10.2 , and 71.9 ± 9.8 years ($P < 0.001$). The CHA₂DS₂-VASc score was similar in patients with paroxysmal and persistent AF (3.1 ± 1.4), but was higher in patients with permanent AF (3.6 ± 1.5 , $P < 0.001$). Yearly ischaemic stroke rates were 2.1, 3.0, and 4.2% for paroxysmal, persistent, and permanent AF, respectively, with adjusted hazard ratio of 1.83 ($P < 0.001$) for permanent vs. paroxysmal and 1.44 ($P = 0.02$) for persistent vs. paroxysmal. Multivariable analysis identified age ≥ 75 year, sex, history of stroke or TIA, and AF pattern as independent predictors of stroke, with AF pattern being the second strongest predictor after prior stroke or TIA.

Conclusion

In a large population of non-anticoagulated AF patients, pattern of AF was a strong independent predictor of stroke risk and may be helpful to assess the risk/benefit for anticoagulant therapy, especially in lower risk patients.

Keywords

Atrial fibrillation • Paroxysmal • Permanent • Stroke

How asymptomatic is “asymptomatic” carotid stenosis?

Resolving fundamental confusion(s)—and confusions yet to be resolved

Piotr Musiałek¹, Iris Q. Grunwald^{2,3}

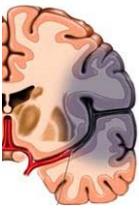
¹ Department of Cardiac and Vascular Diseases, Jagiellonian University Medical College, John Paul II Hospital, Kraków, Poland

² Neuroscience and Vascular Simulation, Anglia Ruskin University, Chelmsford, United Kingdom

³ Southend University Hospital NHS Foundation Trust, Westcliff-on-Sea, United Kingdom

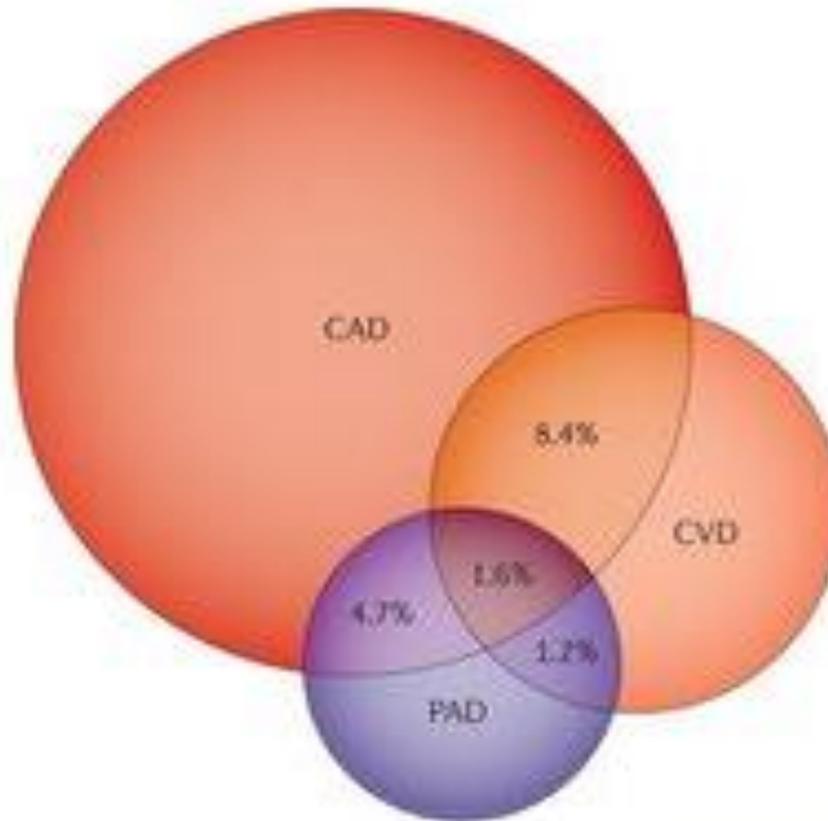
2 recent independent studies demonstrated an annual stroke rate of 2.4%⁷ or 2.9%⁸ in vascular clinic patients with asymptomatic CS on optimized medical therapy (OMT). As the risk is cumulative, the annual risk level of about 2.5% to 3.0% indicates—for instance for a 50-year-old man with an asymptomatic CS on contemporary OMT—a statistical stroke risk of about 25% to 30% by the age of 60 and 50% to 60% by the age of 70 (the actual risk can be still higher when additional risk factors, such as diabetes, are present).² As 85% of strokes occur without a warning sign, and of those who survive stroke (about 40% at 5 years) about half are disabled,² many families and physicians find it difficult to ignore such a risk.⁴ This is particularly relevant because contemporary CS revascularization studies continue to enroll patients with CS strokes despite OMT; this provides circumstantial evidence that OMT, at least in some patients, does not sufficiently protect against stroke.⁴

(Mandatory) *multispecialty* approach



- **AFib (detection, pharmacoTx, deviceTx, ablation)**
- **PFO/ASD**
- **Carotid artery disease**

STROKE –as a **VASCULAR** brain disease– is part of the **PAN**vascular problem



Nature Reviews | Cardiology
2016

Data are from a large registry³ of patients with documented atherothrombosis. CAD, coronary artery disease; CVD, cerebrovascular disease; PAD, peripheral artery disease.



PARADIGM – Extend

an ALL-Comer Study

ZS, lady, 64 years

- h/o 3 minor strokes
- diagnosed with LICA chronic occlusion (DUS, CT-angio)
- RICA 4.7/1.4 m/s, soft, highly irregular plaque suggestive thrombus
- MRI – 2 months prior to Vascular Dept. admission
- referral delayed to GI bleeding requiring transfusion
- currently recurrent TIAs („crescendo”) from both L and R hemisphere...

COM w/ Jaroslawiu

53031806147
*3/18/1953, F, 64Y

SIGNA Explorer
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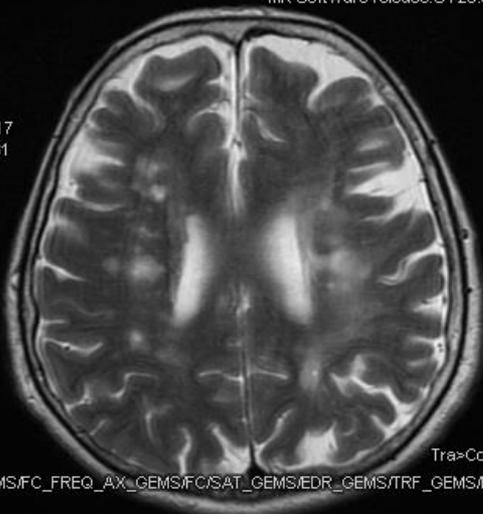
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Ax T2 FRFSE
latest

3099/MJ/2017
STUDY ID 7531
12:45:29 PM
5 IMA 16 /24

RFP



TR 5186.0
TE 101.5
BWV 139.5

SP H22.1
SL 5.0/1.0
FoV 230*230
256*384
Tra>Cor(-21)>Sag(2)
Zoom 0.90
W 2.009
C 1.004

chronic ischemic lesions in both hemispheres

COM w/ Jaroslawiu

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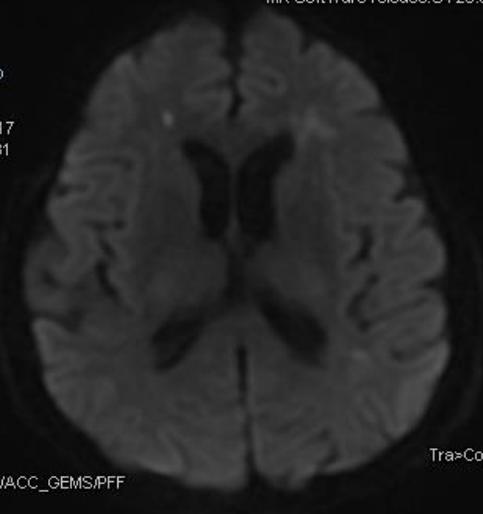
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7 IMA 38 /48

RFP



TR 5834.0
TE 84.5
BWV 1953.1

SP H10.1
SL 5.0/1.0
FoV 230*230
128*128
Tra>Cor(-21)>Sag(2)
Zoom 1.80
W 3.956
C 1.828

new DWI lesion in R hemisphere

AHR

COM w/ Jaroslawiu

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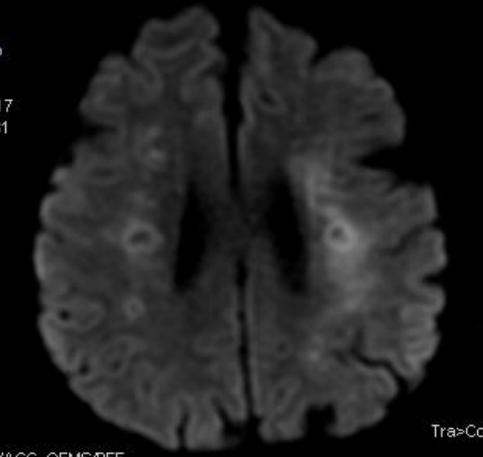
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Zoom 1.81
W 1.950
C 1.275

"fresh" ischemia surrounding old lesions

AHR

COM w/ Jaroslawiu

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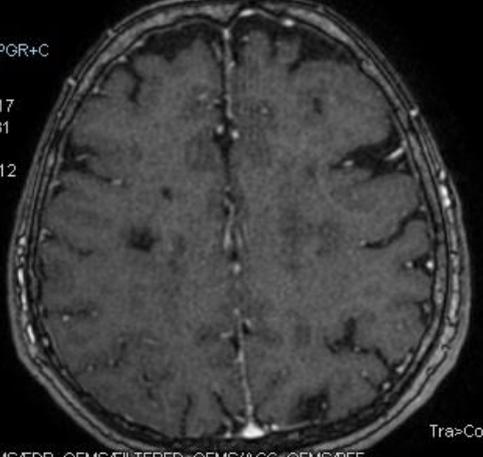
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latest

3099/MJ/2017
STUDY ID 7531
12:57:11 PM
10 IMA 140 /312

RFP



TR 6.9
TE 2.1
BWV 122.1

SP H23.0
SL 1.0
FoV 241*241
240*240
Tra>Cor(-23)>Sag(3)
Zoom 0.90
W 4.637
C 2.318

chronic ischemic lesion in R hemisphere

COM w Jaroslawiu

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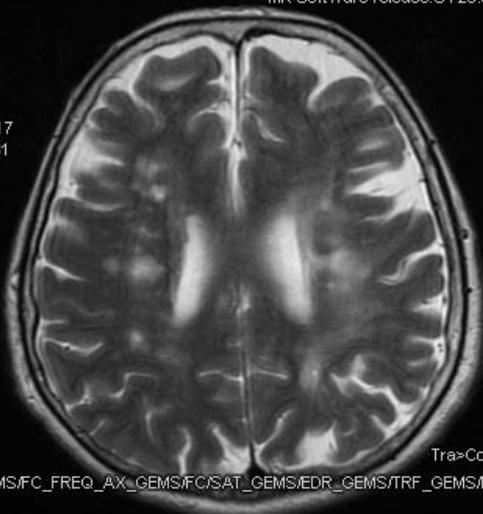
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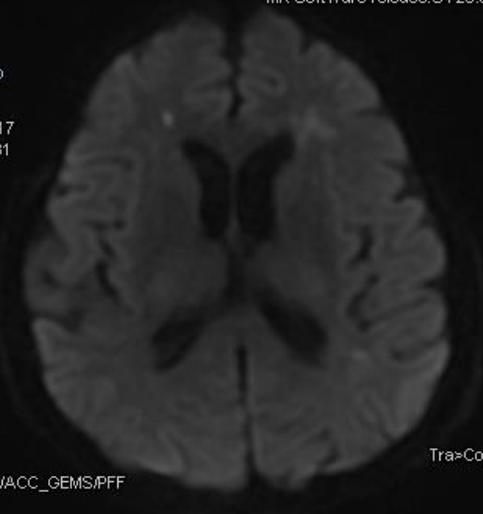
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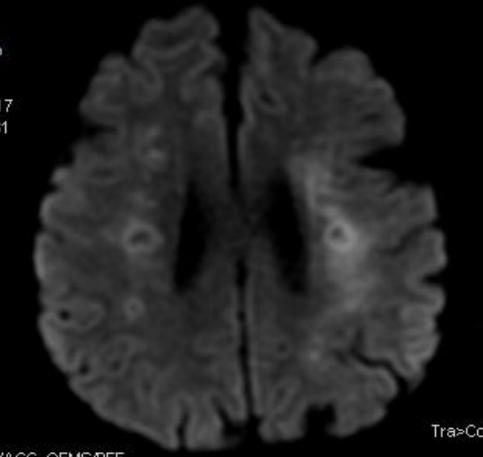
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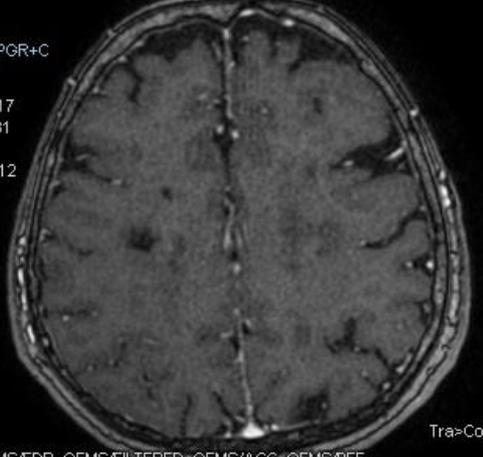
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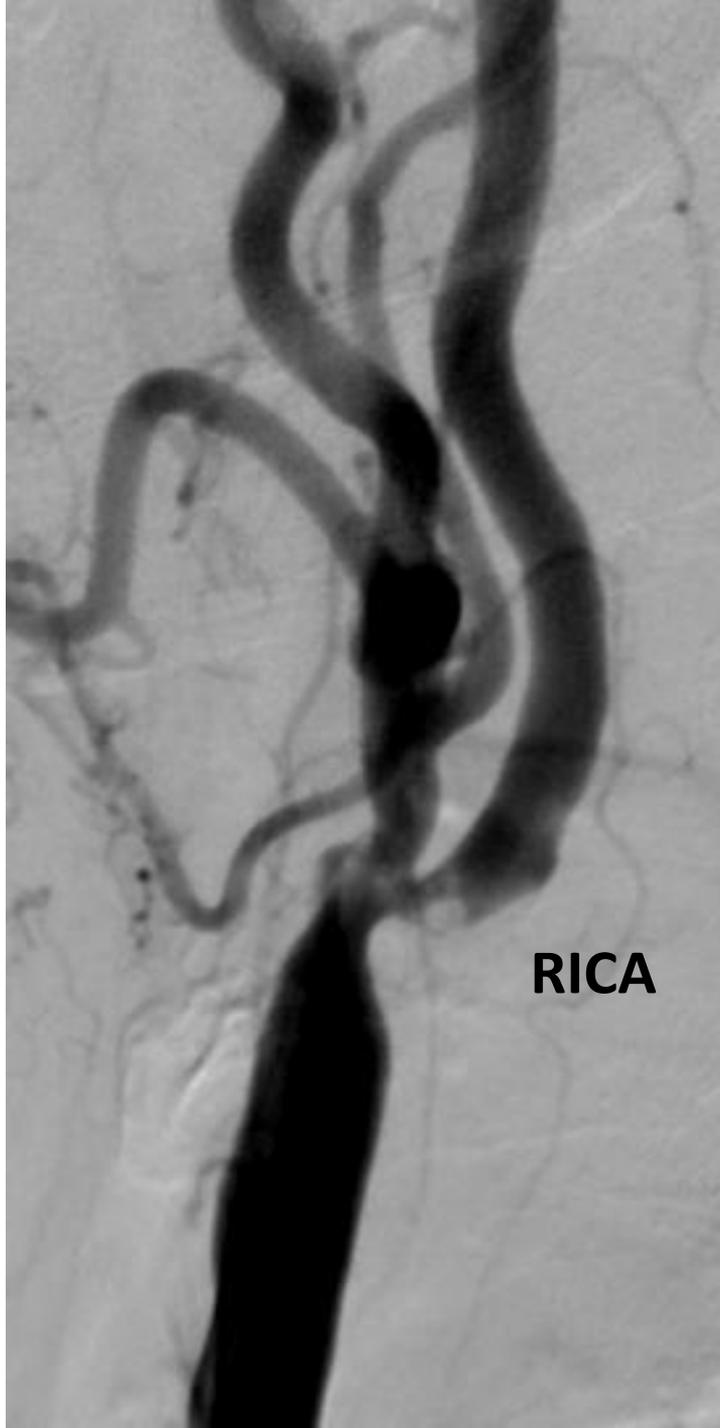
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chronic ischemic lesion in R hemisphere

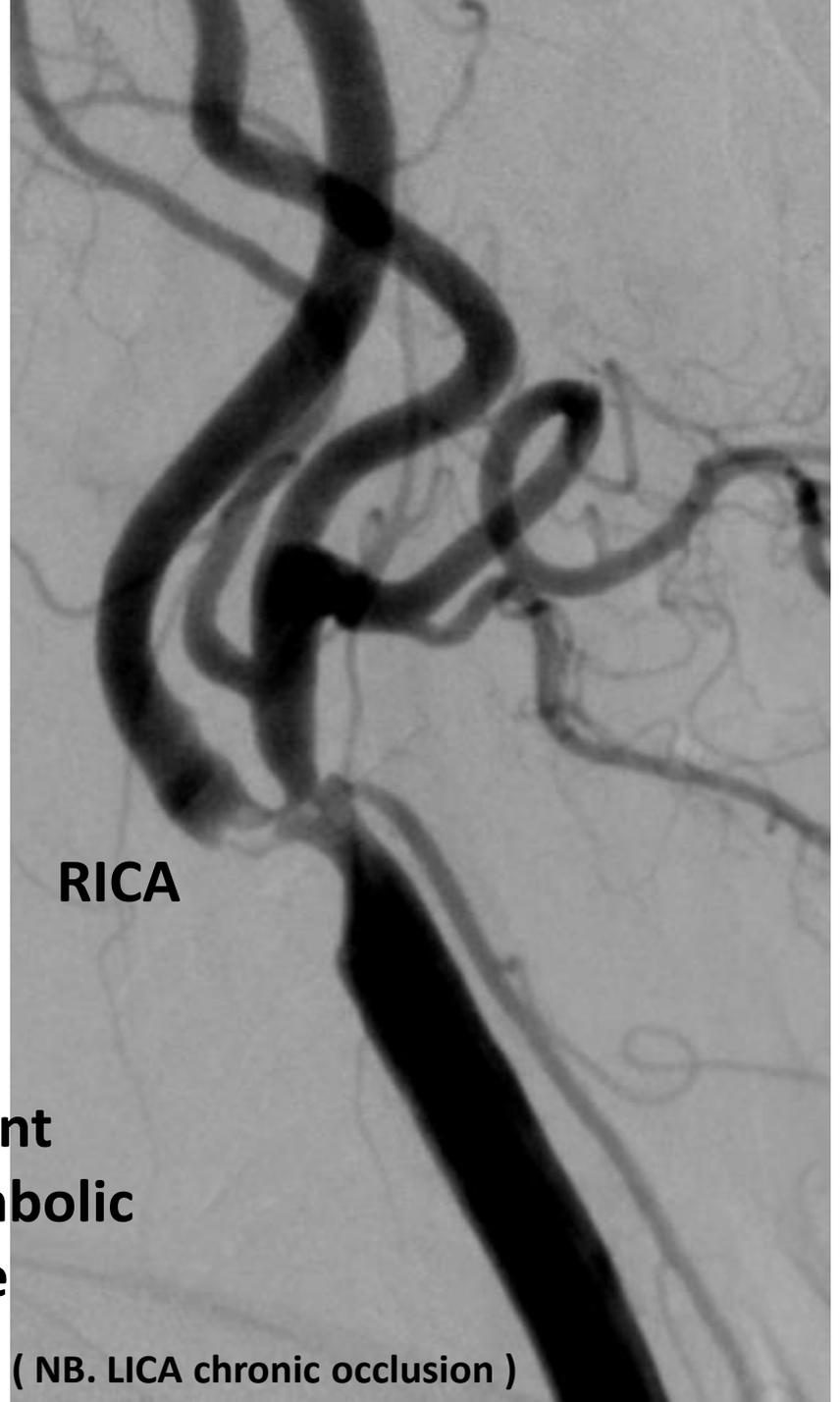
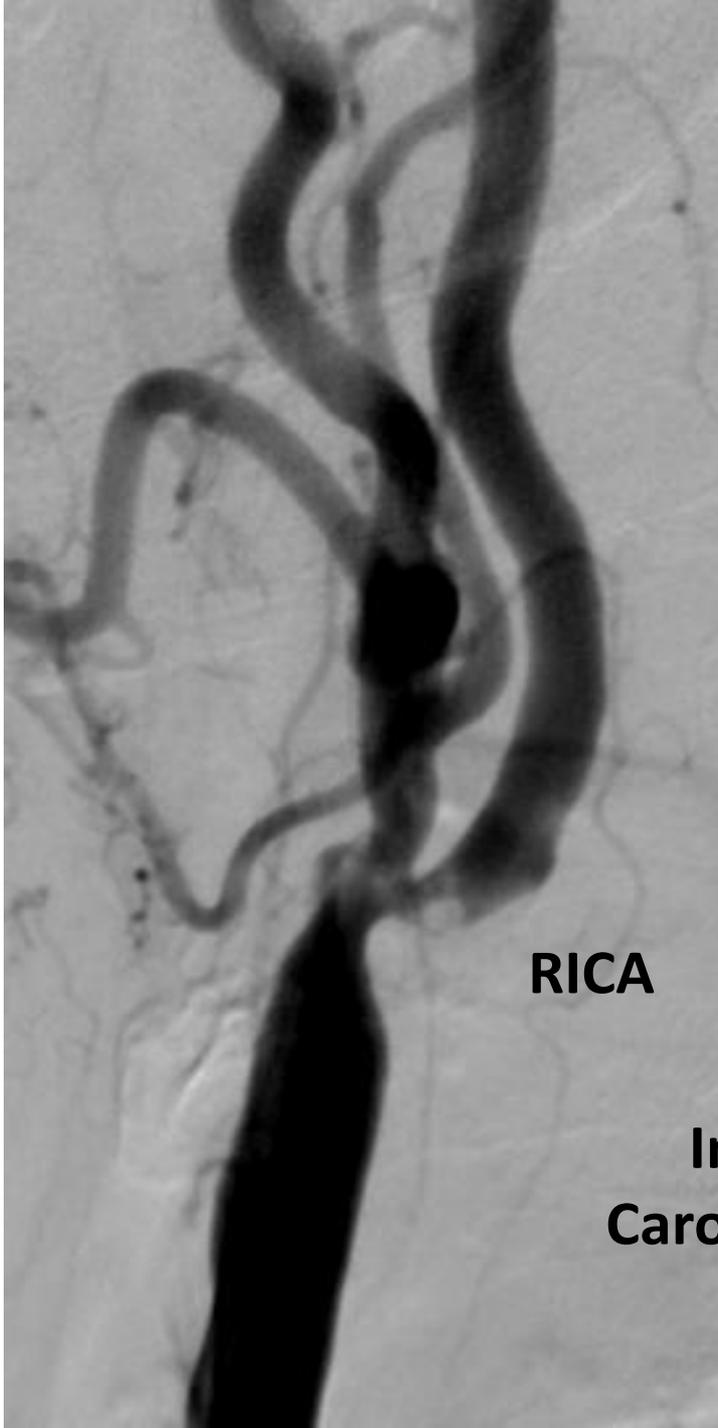


RICA



RICA

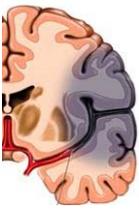
(NB. LICA chronic occlusion)



**Imminent
Carotid-Embolic
Stroke**

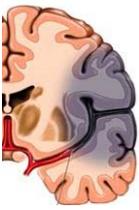
(NB. LICA chronic occlusion)

“Who” (...“should”? ...“be allowed”?) to perform
intervention?



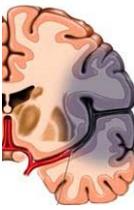
- **Neurologist ?**

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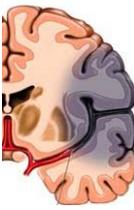
- **Neurologist ?**
- **Radiologist ?**

“Who” (...“should”? ...“be allowed”?) to perform
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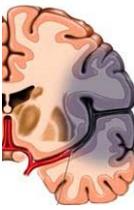
- **Neurologist ?**
- **Radiologist ?**
- **Vascular surgeon?**

“Who” (...“should”? ...“be allowed”?) to perform
intervention?



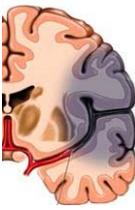
- **Neurologist ?**
- **Radiologist ?**
- **Vascular surgeon?**
- **Cardiologist ?**

“Who” (...“should”? ...“be allowed”?) to perform
intervention?



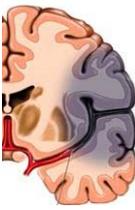
- **Neurologist ?**
- **Radiologist ?**
- **Vascular surgeon?**
- **Cardiologist ?**
- **Angiologist ?**

“Who” (...“should”? ...“be allowed”?) to perform
intervention?



- **Neurologist ?**
- **Radiologist ?**
- **Vascular surgeon?**
- **Cardiologist ?**
- **Angiologist ?**
- **Neurosurgeon ?**

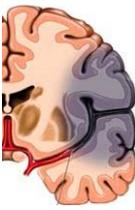
“Who” (...“should”? ...“be allowed”?) to perform intervention?



- Neurologist ?
- Radiologist ?
- Vascular surgeon?
- Cardiologist ?
- Angiologist ?
- Neurosurgeon ?

-> the one who CAN do it

“Who” (...“should”? ...“be allowed”?) to perform intervention?



- Neurologist ?
- Radiologist ?
- Vascular surgeon?
- Cardiologist ?
- Angiologist ?
- Neurosurgeon ?

**-> the one who CAN do it
CAN do it well/safely**

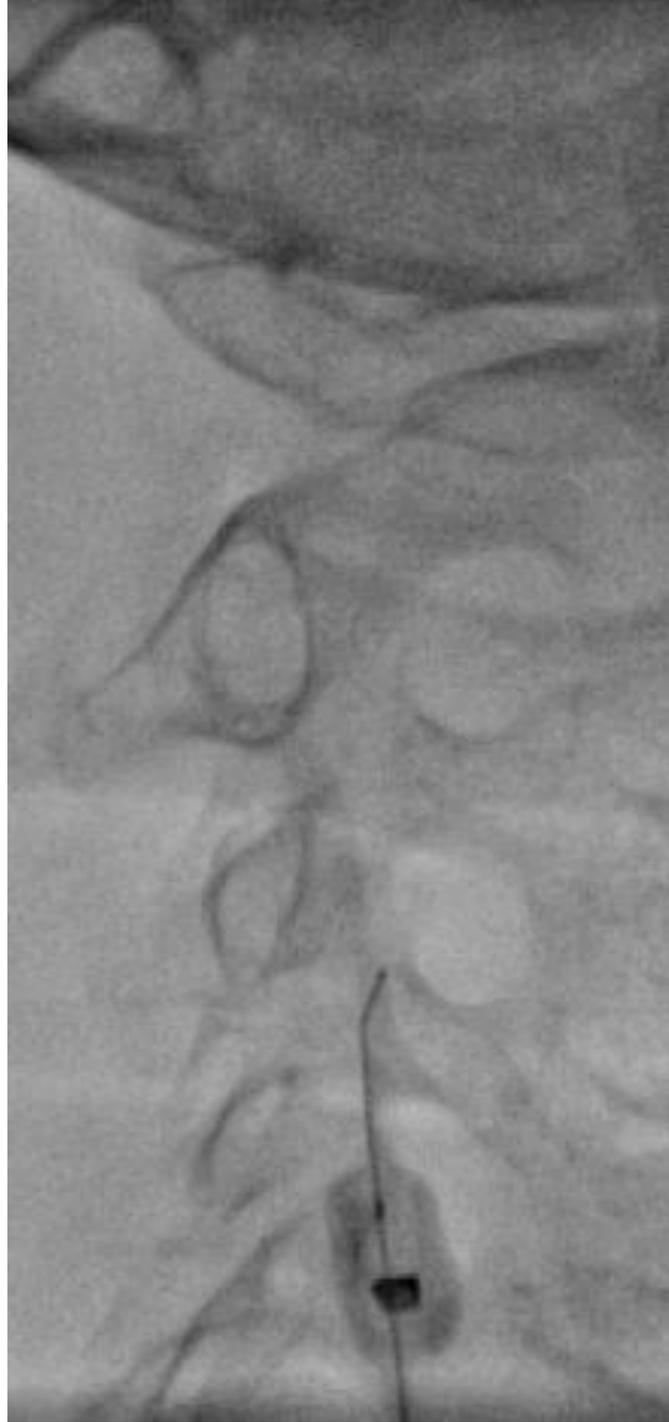


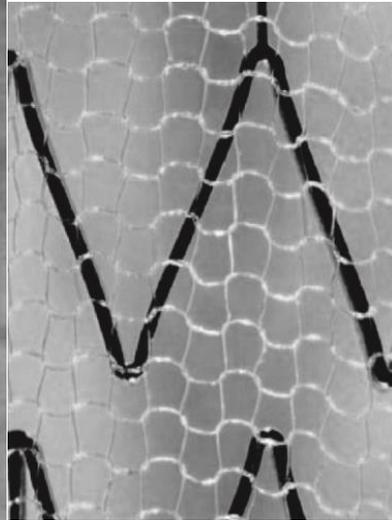
PARADIGM-Extend

continues as an ALL-Comer Study

Back pressure 58/47mmHg

(4min tolerance test)



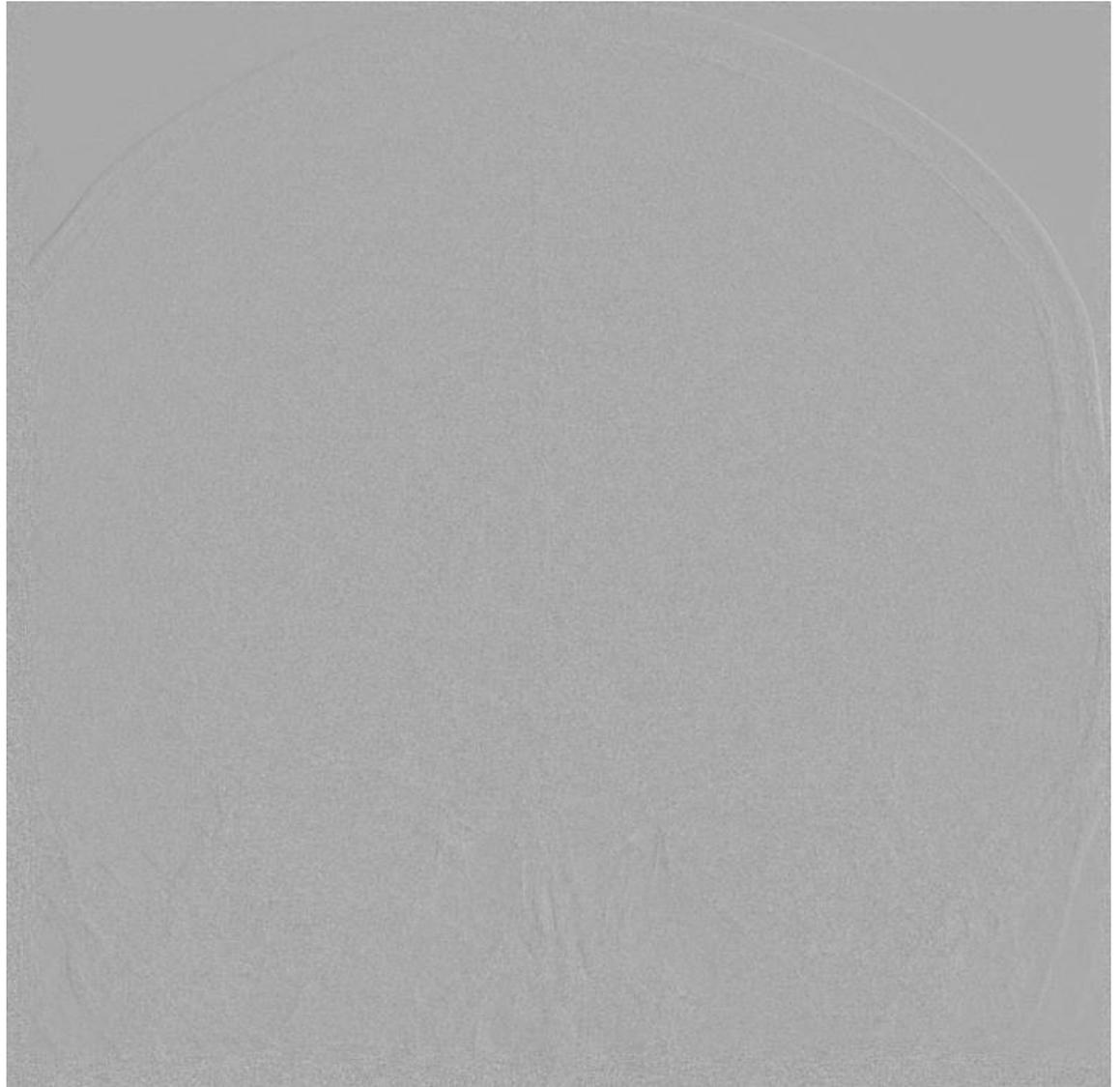




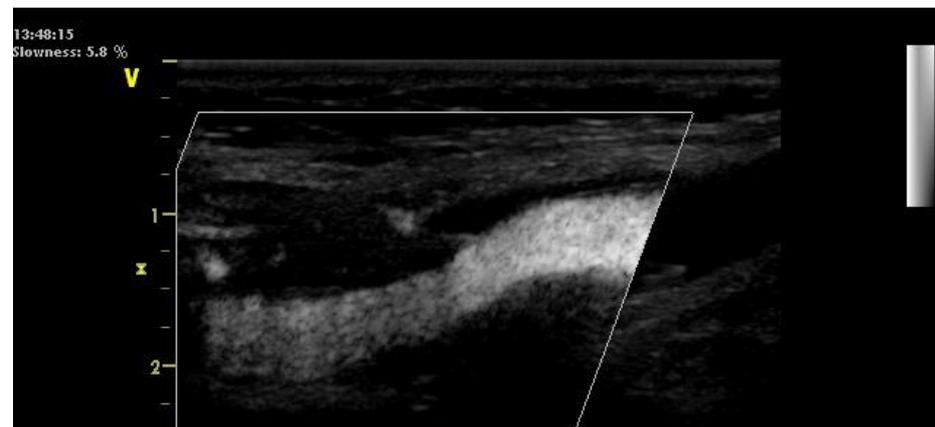
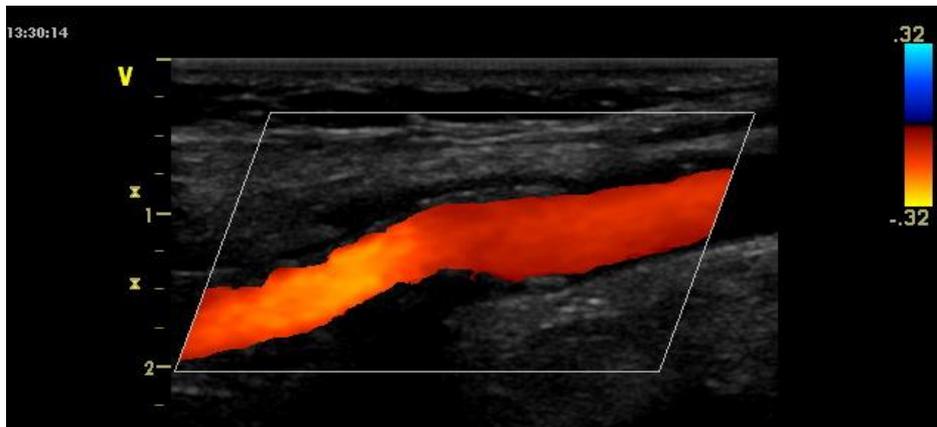
**Flow reversal time 7min 10sec
Intolerance in the last 80sec
(active aspiration still !! performed)**



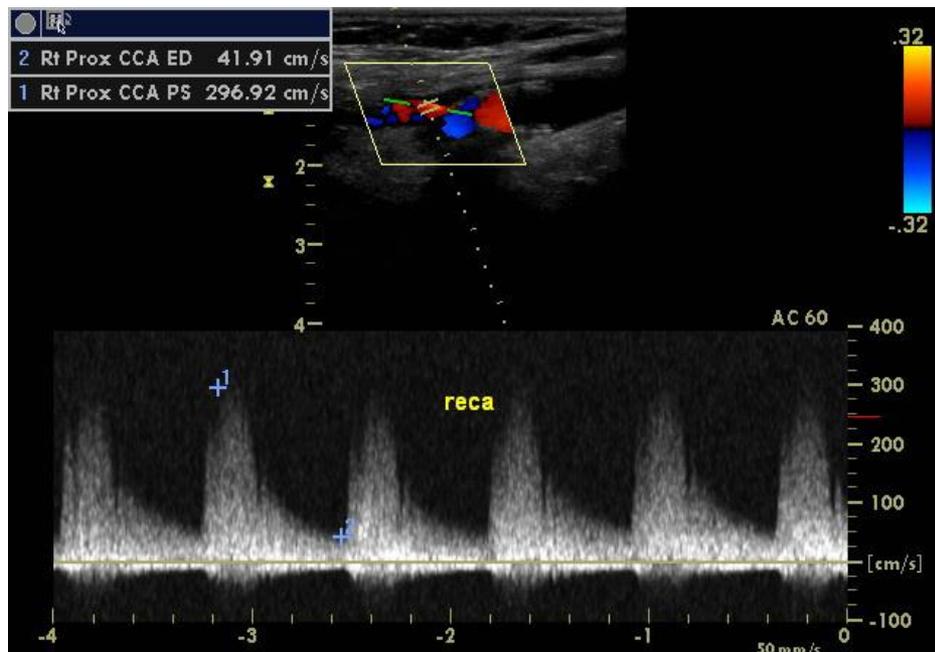
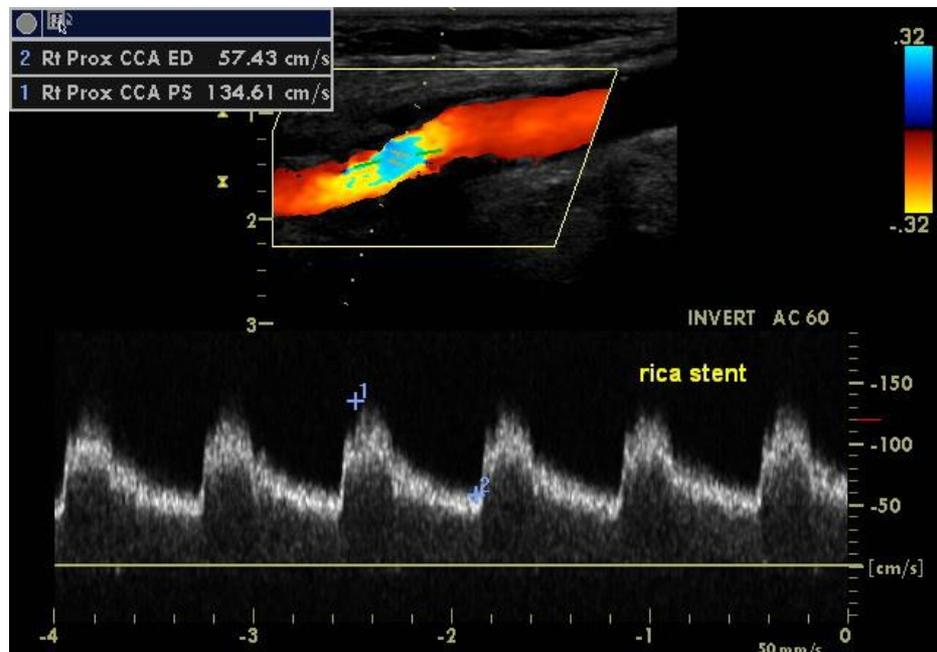
Final Result



Patient A/S, discharged home @ Day2 post procedure



Normal stent image



Normal velocities

ECA patent

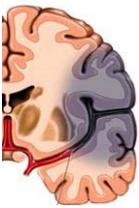


“Who” (...“should”? ...“be allowed”?) to perform intervention in **Acute Ischaemic Stroke**?

- Neurologist ?
- Radiologist ?
- Vascular surgeon?
- Cardiologist ?
- Angiologist ?
- Neurosurgeon ?

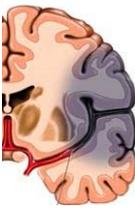
-> the one who CAN do it
CAN do it well/safely

Acute Ischaemic Stroke
= **vascular** brain disease



Neurologist
Stroke Unit

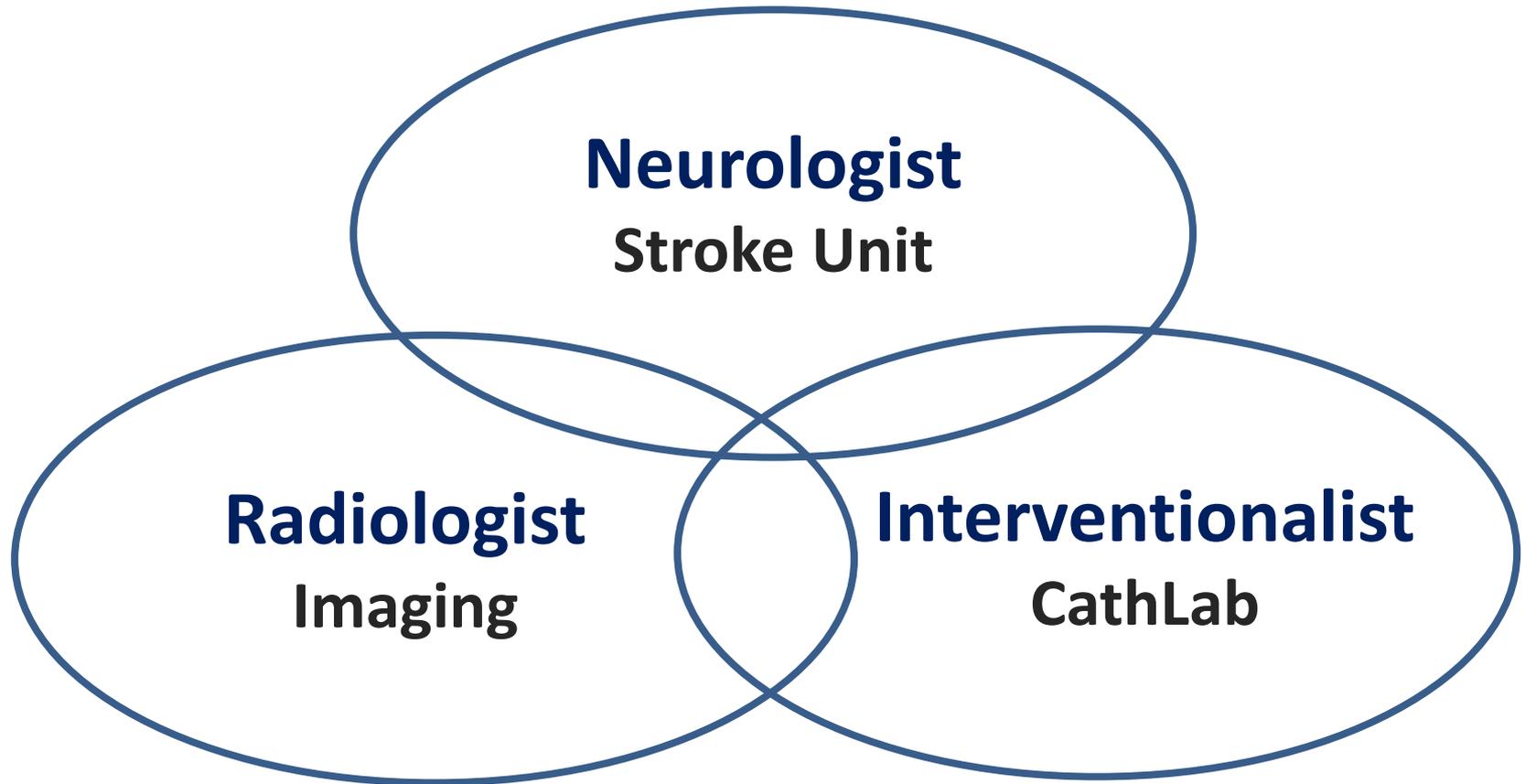
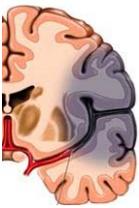
Acute Ischaemic Stroke
= **vascular** brain disease



Neurologist
Stroke Unit

Radiologist
Imaging

Acute Ischaemic Stroke = **vascular** brain disease



Acute Ischaemic Stroke
= cerebral **vascular** disease



- **SCALE OF THE PROBLEM / NEEDS**
POLAND

at least
6 000 TEs / year

Acute Ischaemic Stroke = cerebral **vascular** disease



- **SCALE OF THE PROBLEM / NEEDS**

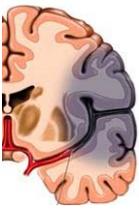
POLAND

at least

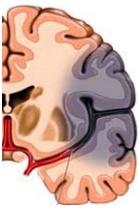
6 000 TEs / year

cf., 7-13% of the 60 000 – 70 000 ischaemic strokes in Poland;
11 700 registered TEs in Germany in 2017
(Poland population \approx 50% Germany population)

STARTING POINT



March 2018



UNMET

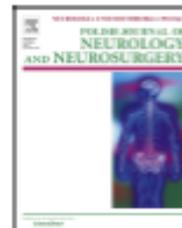
NEED



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Available online at www.sciencedirect.com

ScienceDirect

journal homepage: <http://www.elsevier.com/locate/pjnns>

Original research article

Mechanical thrombectomy in acute stroke – Five years of experience in Poland

Polish Thrombectomy Initiative¹

A. Słowik
(...)
T. Popiela

ARTICLE INFO

Article history:

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Keywords:

Acute stroke

Treatment

Mechanical thrombectomy

ABSTRACT

Objective: Mechanical thrombectomy (MT) is not reimbursed by the Polish public health system. We present a description of 5 years of experience with MT in acute stroke in Comprehensive Stroke Centers (CSCs) in Poland.

Methods and results: We retrospectively analyzed the results of a structured questionnaire from 23 out of 25 identified CSCs and 22 data sets that include 61 clinical, radiological and outcome measures.

Results: Most of the CSCs (74%) were founded at University Hospitals and most (65.2%) work round the clock. In 78.3% of them, the working teams are composed of neurologists and neuro-radiologists. All CSCs perform CT and angio-CT before MT. In total 586 patients were subjected to MT and data from 531 of them were analyzed. Mean time laps from stroke onset to groin puncture was 250 ± 99 min. 90.3% of the studied patients had MT within 6 h from stroke onset; 59.3% of them were treated with IV rt-PA prior to MT; 15.1% had IA rt-PA during MT and 4.7% – emergent stenting of a large vessel. MI of MCA was occluded in 47.8% of cases. The Solitaire device was used in 53% of cases. Successful recanalization (TICI2b–TICI3) was achieved in 64.6% of cases and 53.4% of patients did not experience hemorrhagic transformation. Clinical improvement on discharge was noticed in 53.7% of cases, futile recanalization – in 30.7%, mRS of 0–2 – in 31.4% and mRS of 6 in 22% of cases.

Conclusion: Our results can help harmonize standards for MT in Poland according to international guidelines.

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586 TEs

STARTING POINT

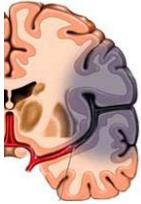
March 2018



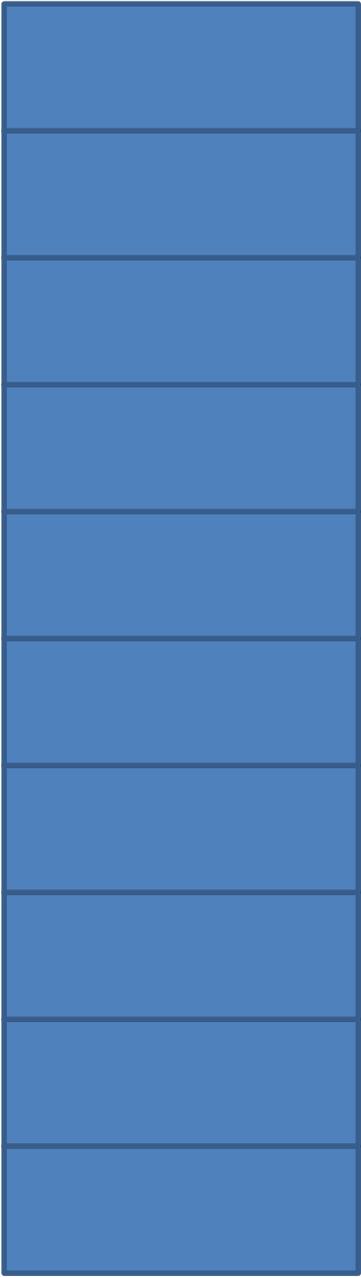
Performed
over **5** years

STARTING POINT

March 2018



Performed
over **5** years



NEEDED
per **1** year



**Minister of Health Regulation (bill) on Mechanical Thrombectomy
"READY-TO-BE-PUBLISHED FOR IMPLEMENTATION"**

46	99.106 Terapia łączona mechanicznego udrażniania domózgowych lub wewnątrzmożgowych tętnic z dożylnym podaniem leku fibrynolitycznego w ostrej fazie udaru niedokrwiennego	Wymagania formalne	CathLab requirement to qualify " needs to have performed at least 300 intracranial vascular pocedures "
		<ol style="list-style-type: none">1) oddział o profilu neurologia z oddziałem lub pododdziałem udarowym, w którym systemowe leczenie trombolityczne prowadzone jest u co najmniej 15% chorych z udarem niedokrwiennym rocznie;2) zakład lub pracownia radiologii zabiegowej, w którym wykonano co najmniej <u>300 procedur</u> leczenia endowaskularnego naczyń mózgowych;3) oddział neurochirurgii zabezpieczający możliwość wykonywania hemikraniektomii w także w ramach dyżuru medycznego - w lokalizacji.	

plus ON-SITE Neurosurgery mandatory

STARTING POINT

March 2018

Minister of Health Regulation (bill)
"READY-TO-BE-PUBLISHED FOR IMPLEMENTATION"



46	99.106 Terapia łączona mechanicznego udrażniania domózgowych lub wewnątrzmożgowych tętnic z dożylnym podaniem leku fibrynolitycznego w ostrej fazie udaru niedokrwiennego	Wymagania formalne
----	---	--------------------

Personel

W trakcie realizacji świadczenia:

- 1) lekarze: specjalista w dziedzinie rentgenodiagnostyki lub radiologii, lub radiodiagnostyki, lub radiologii i diagnostyki obrazowej, lub specjalista w dziedzinie neurochirurgii lub neurochirurgii i neurotraumatologii, lub specjalista w dziedzinie neurologii, z odpowiednim doświadczeniem w wykonywaniu zabiegów z zakresu neuroradiologii zabiegowej, obejmującym:
 - a) uczestnictwo w co najmniej 150 zabiegach z zakresu neuroradiologii zabiegowej (embolizacji tętniaków naczyń mózgowych, embolizacji malformacji naczyń mózgu lub rdzenia, embolizacji przetok oponowych mózgu lub rdzenia, embolizacja w zakresie unaczynienia tętnicy szyjnej zewnętrznej, leczenia wewnątrznaczyniowego udaru niedokrwiennego mózgu), w tym nie mniej niż 50 zabiegach przeprowadzonych samodzielnie w zakresie neuroradiologii zabiegowej w tym samym okresie oraz 250 angiografiach mózgowych wykonanych samodzielnie,
 - b) co najmniej 30 zabiegów z zakresu neuroradiologii zabiegowej przeprowadzanych samodzielnie w ciągu ostatniego roku,
 - c) 12-miesięczny staż w zakresie diagnostyki neuroradiologicznej oraz 1-miesięczny staż kliniczny w oddziale neurologii dla lekarzy praktykujących zabiegi neuroradiologiczne.
- 2) pielęgniarka przeszkolona w zakresie czynności wykonywanych w tej procedurze;
- 3) pozostały personel: zapewnienie udziału w realizacji świadczenia przez technika elektroradiologa.

Physician-operator requirements to qualify

" has participated in at least 150 intracranial vascular procedures including coiling and malformation treatment, of which at least 50 on his/her own, and at least 30 within the last year "

STARTING POINT

March 2018

Minister of Health Regulation (bill)
"READY-TO-BE-PUBLISHED FOR IMPLEMENTATION"



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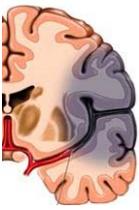
(Interventional) Cardiology/Angiology initially NOT listed as approved specialties; then got listed with the numeric requirements as above *plus* 12-month formalized neuroradiology training

What did I do?



March/April 2018

What did I do?



1. I read the Guidelines

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

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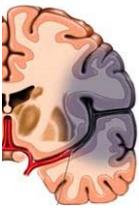
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David L. Tirschwell, MD, MSc, FAHA; on behalf of the American Heart Association Stroke Council

**NO on-site Neurosurgery requirement
for TE-Capable Centers**

What did I do?



1. I Read the Guidelines

2. I called -and repeatedly emailed- Friends

The ONLY way to negotiate effectively



=

to bring up

MERITOCRATIC

ARGUMENTS (Data)

-those cannot be beaten-

(consciously avoiding "politics")

AHA/ASA Guideline

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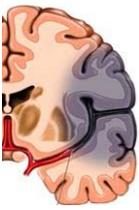
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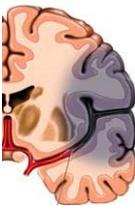
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24 / 7 / 365

Acute Ischaemic Stroke = **vascular** brain disease



“Who” (...“should”? ...“be allowed to”?)
perform the intervention?

- Revascularization $\leq 2h$ from symptom onset
=> full recovery in 90%
- Revascularization $> 6h$
=> full recovery in 20-30%

Acute Ischaemic Stroke = **vascular** brain disease



“Who” (...“should”? ...“be allowed to”?)
perform the intervention?

- **LOGISTICS**

*One of the **worst** things you can do to a Thrombectomy Candidate is...*

Acute Ischaemic Stroke = **vascular** brain disease



“Who” (...“should”? ...“be allowed to”?)
perform the intervention?

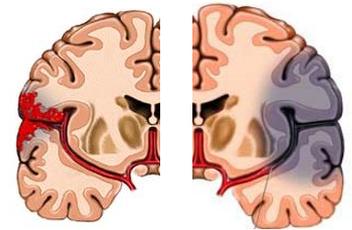
- **LOGISTICS**

*One of the **worst** things you can do to a Thrombectomy Candidate is...*

BETWEEN-HOSPITAL TRANSPORT!

2018

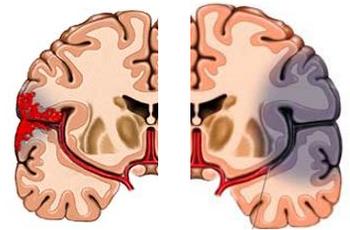
- **Comprehensive Stroke Center**



Joint Commission for Accreditation of Hospital Organizations (JACHO)/ American Heart Association (AHA)

2018

- **Comprehensive Stroke Center**



- **Thrombectomy-Capable Center**

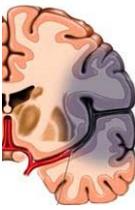


Joint Commission for Accreditation of Hospital Organizations (JACHO)/ American Heart Association (AHA)

“Who” (...“should”? ...“be allowed to”?) perform intervention in **Acute Ischaemic Stroke**?



- ***Any*** Neurologist ?
- ***Any*** Radiologist ?
- ***Any*** Vascular surgeon?
- ***Any*** Cardiologist ?
- ***Any*** Angiologist ?
- ***Any*** Neurosurgeon ?



“Who” (...“should”? ...“be allowed to”?) perform intervention in **Acute Ischaemic Stroke**?

- **Any** Neurologist ?
- **Any** Radiologist ?
- **Any** Vascular surgeon?
- **Any** Cardiologist ?
- **Any** Angiologist ?
- **Any** Neurosurgeon ?

NO -> the one who **CAN** do it
CAN do it well/safely



Warszawa, dnia 16 października 2018 r.

Poz. 1985

ROZPORZĄDZENIE
MINISTRA ZDROWIA¹⁾
z dnia 11 października 2018 r.

w sprawie programu pilotażowego dotyczącego leczenia ostrej fazy udaru niedokrwiennego za pomocą przecewnikowej trombektomii mechanicznej naczyń domózgowych lub wewnątrzczaszkowych

Na podstawie art. 48e ust. 5 ustawy z dnia 27 sierpnia 2004 r. o świadczeniach opieki zdrowotnej finansowanych ze środków publicznych (Dz. U. z 2018 r. poz. 1510, z późn. zm.²⁾) zarządza się, co następuje:

§ 1. Rozporządzeniem ustala się program pilotażowy dotyczący leczenia ostrej fazy udaru niedokrwiennego za pomocą przecewnikowej trombektomii mechanicznej naczyń domózgowych lub wewnątrzczaszkowych.

§ 2. Użyte w rozporządzeniu określenia oznaczają:

- 1) Fundusz – Narodowy Fundusz Zdrowia;
- 2) pilotaż – program pilotażowy dotyczący leczenia ostrej fazy udaru niedokrwiennego za pomocą przecewnikowej trombektomii mechanicznej naczyń domózgowych lub wewnątrzczaszkowych;
- 3) zabieg – zabieg przecewnikowej trombektomii mechanicznej naczyń domózgowych lub wewnątrzczaszkowych;
- 4) lekarz specjalista – lekarza, który posiada specjalizację II stopnia lub tytuł specjalisty w określonej dziedzinie medycyny;
- 5) miejsce udzielania świadczeń – pomieszczenie lub zespół pomieszczeń w tej samej lokalizacji, powiązanych funkcjonalnie i organizacyjnie, w celu wykonywania świadczeń gwarantowanych;
- 6) dostęp – zapewnienie realizacji świadczeń gwarantowanych w innym miejscu udzielania świadczeń lub lokalizacji niż ta, w której świadczenia te są udzielane;
- 7) lokalizacja – budynek lub zespół budynków oznaczonych tym samym adresem albo oznaczonych innymi adresami, ale położonych obok siebie i tworzących funkcjonalną całość, w których zlokalizowane jest miejsce udzielania świadczeń;
- 8) NIHSS – National Institutes of Health Stroke Scale – Skala Udarowa Narodowego Instytutu Zdrowia;
- 9) TICI – thrombolysis in cerebral infarction – trombolizę w udarze niedokrwiennym mózgu.

§ 3. Celem pilotażu jest ocena skuteczności praktycznej oraz wypracowanie optymalnego modelu organizacji leczenia ostrej fazy udaru niedokrwiennego za pomocą przecewnikowej trombektomii mechanicznej naczyń domózgowych lub wewnątrzczaszkowych.



Warszawa, dnia 16 października 2018 r.

Poz. 1985

ROZPORZĄDZENIE
MINISTRA ZDROWIA¹⁾

z dnia 11 października 2018 r.

Current centre and operator TE requirements COMBINE CAS and Intracranial experience

2) personel (w trakcie zabiegu):

a) lekarz specjalista: w dziedzinie rentgenodiagnostyki lub radiologii, lub radiodiagnostyki, lub radiologii i diagnostyki obrazowej, lub w dziedzinie neurochirurgii lub neurochirurgii i neurotraumatologii, lub w dziedzinie neurologii, lub w dziedzinie kardiologii spełniający wymagania samodzielnego operatora według Asocjacji Interwencji Sercowo-Naczyniowych Polskiego Towarzystwa Kardiologicznego, lub w dziedzinie angiologii, lub w dziedzinie chirurgii naczyniowej – z doświadczeniem w wykonywaniu zabiegów z zakresu neuroradiologii zabiegowej, potwierdzonym przez konsultanta wojewódzkiego właściwego dla specjalizacji tego lekarza, obejmującym:

– uczestnictwo w co najmniej 150 zabiegach z zakresu neuroradiologii, w tym co najmniej 50 zabiegów przeprowadzonych samodzielnie (w tej liczbie zabiegów uwzględnia się zabiegi: zaopatrywanie malformacji naczyń mózgowych; embolizacja tętniaków, naczyniaków, przetok; zakładanie stentów do naczyń wewnątrzczaszkowych; trombektomia) albo wykonanie 50 zabiegów z zakresu endowaskularnego leczenia naczyń domózgowych i wewnątrzczaszkowych (w tym co najmniej 5 zabiegów leczenia naczyń wewnątrzczaszkowych wykonanych samodzielnie lub w obecności proktora, który wykonał samodzielnie co najmniej 50 zabiegów wewnątrzczaszkowych).

– potwierdzone certyfikatem ukończenie kursu: doskonalącego organizowanego przez Centrum Medyczne Kształcenia Podyplomowego: „Wewnątrznaczyniowe leczenie udarów niedokrwiennych mózgu” lub kursu w zagranicznym ośrodku trombektomii naczyń mózgowych obejmującego program realizowany w ramach kursu organizowanego przez Centrum Medyczne Kształcenia Podyplomowego oraz

– dla lekarzy specjalistów niebędących specjalistami w dziedzinie rentgenodiagnostyki lub radiologii, lub radiodiagnostyki, lub radiologii i diagnostyki obrazowej, lub neurochirurgii lub neurochirurgii i neurotraumatologii, lub neurologii odbycie 3-miesięcznego stażu obejmującego zapoznanie się z organizacją pracy oraz obowiązującym postępowaniem w zakresie nieinwazyjnej diagnostyki neuroradiologicznej w oddziale o profilu neurologia z oddziałem lub pododdziałem udarowym,

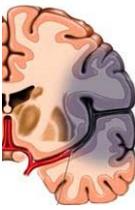
b) lekarz specjalista w dziedzinie anestezjologii lub anestezjologii i reanimacji, lub anestezjologii i intensywnej terapii,

**For operator:
N [CAS or Intracr.]
= at least 50

incl.
at least n=5
intracranial**

Centre: needs to have performed at least 150 [CAS or Intracranial] procedures + individual centre approval by the Ministry

Current TE Regulations in Poland (Ministry of Health Bill => legal requirements)



Mechanical Thrombectomy in Ischaemic Stroke...

= MULTI-SPECIALTY PROCEDURE

- **Training/competence requirements**
 - Centre/Cathab
 - Operator
- **On-site Stroke Unit, 24/7/365 CT/MRI**
- **No need for on-site surgery** (30min + transfer agreement)
- **Tight monitoring of outcomes**





M, 58y

NIH-SS 12

mRankin 2



NIH-SS 12

mRankin 2



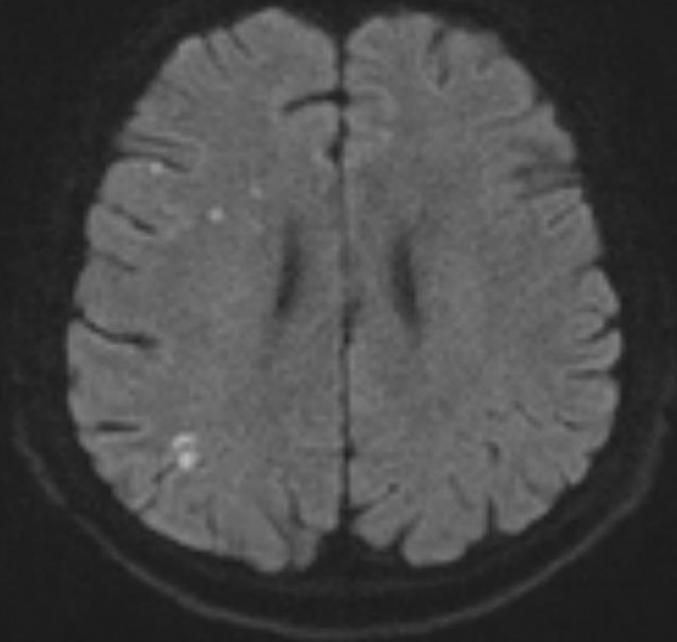
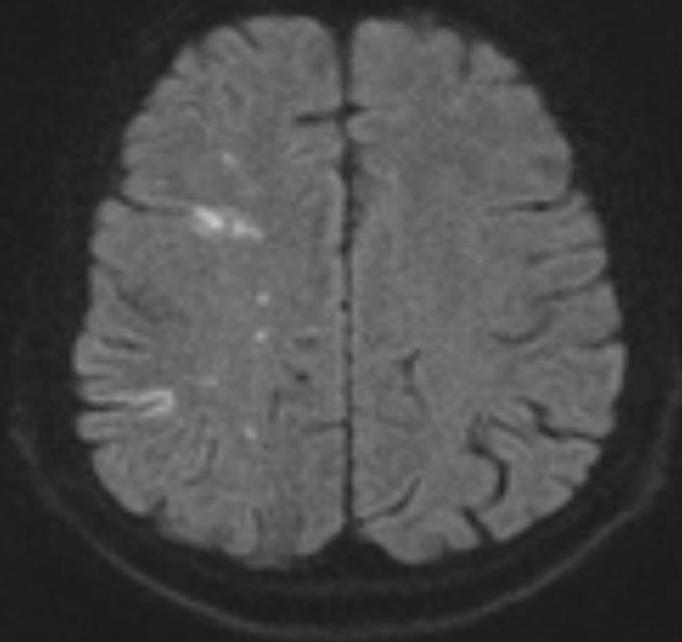
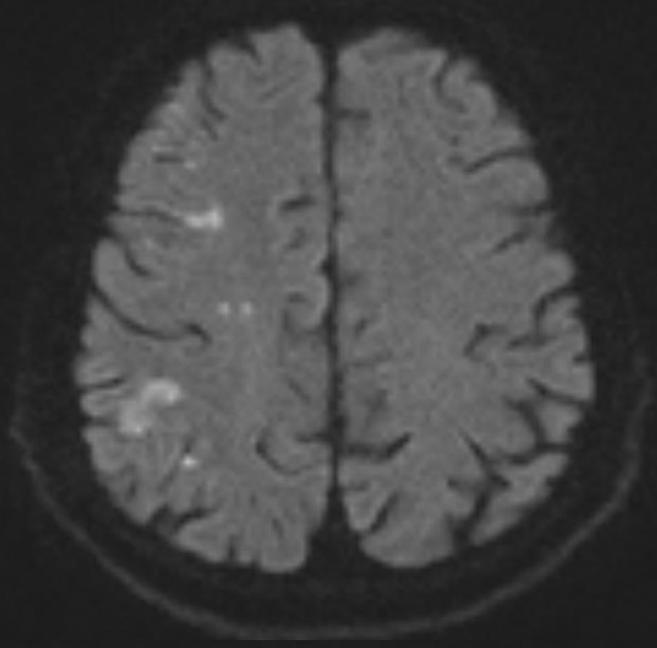
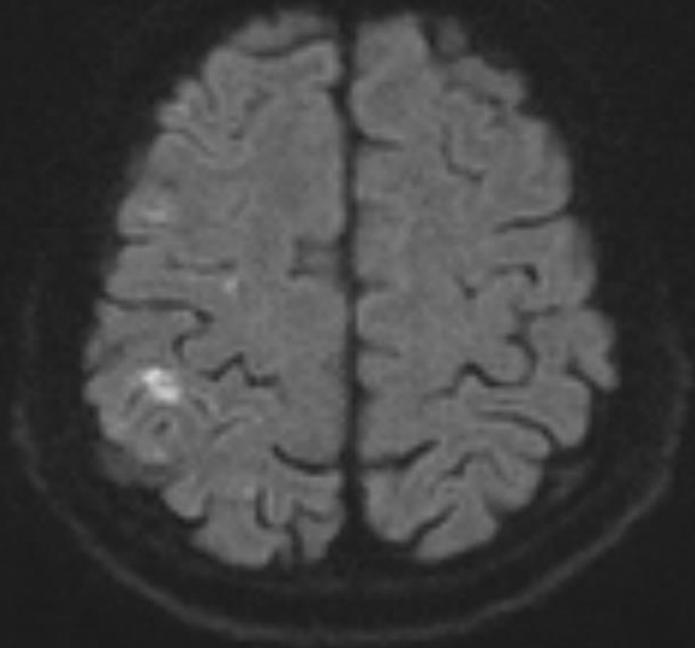


NIH-SS 12

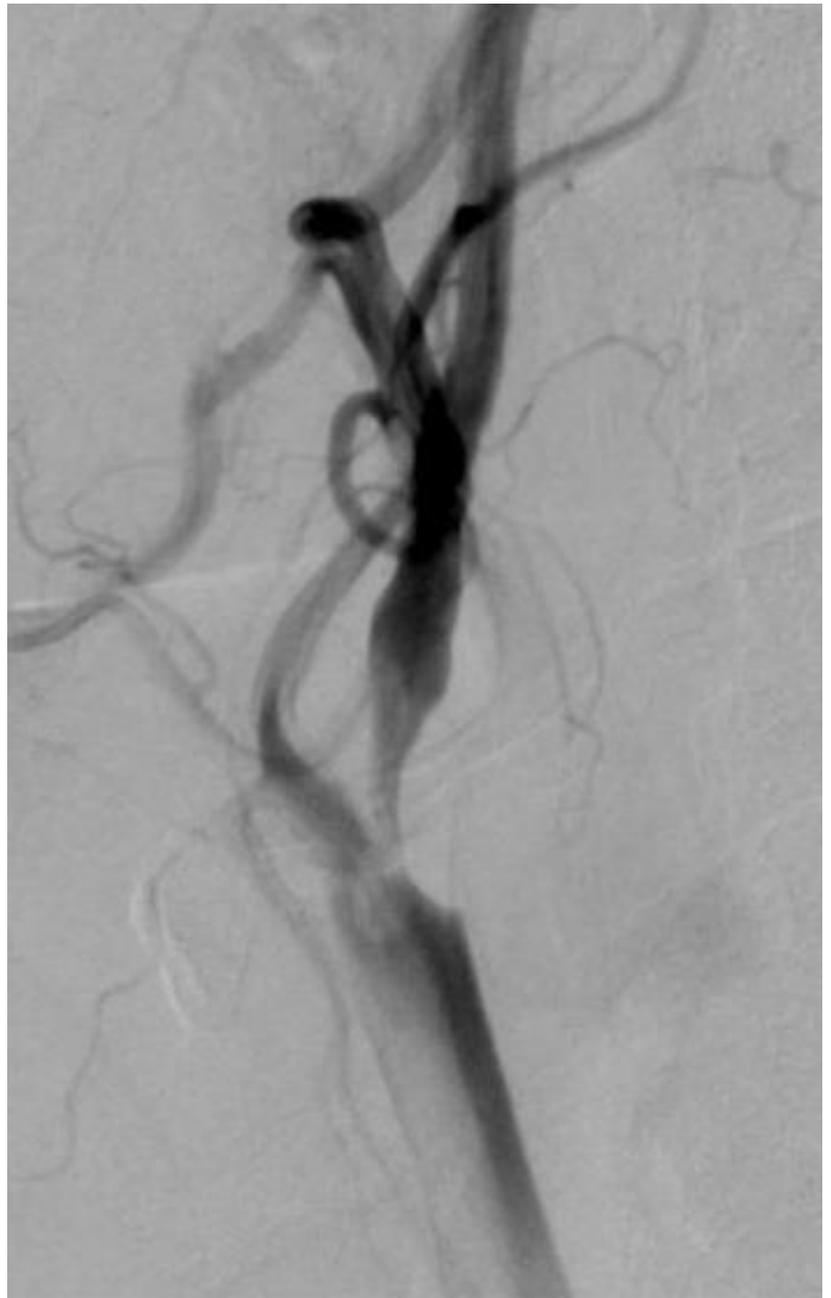
mRankin 2



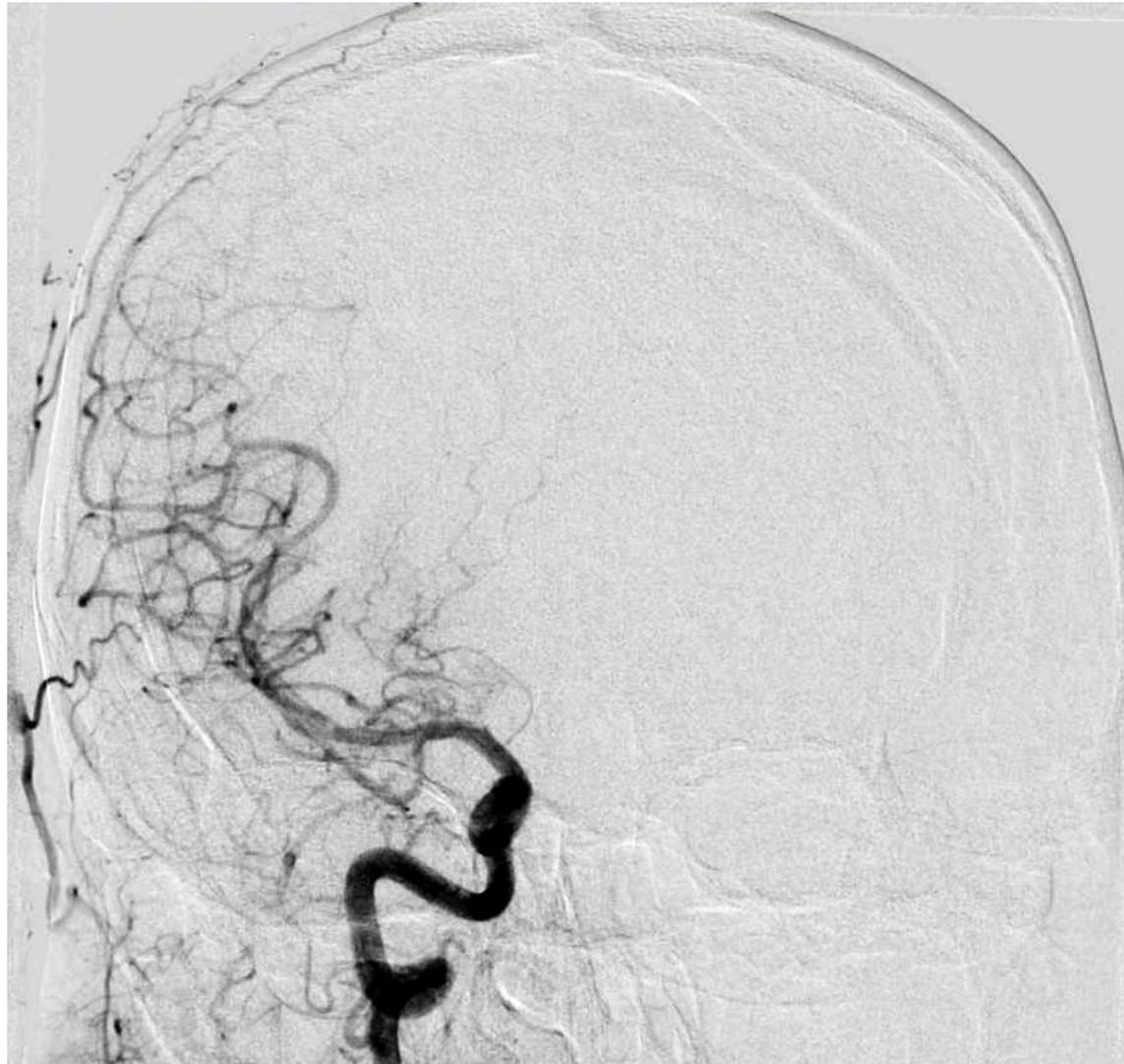
Crescendo R haemispheric stroke



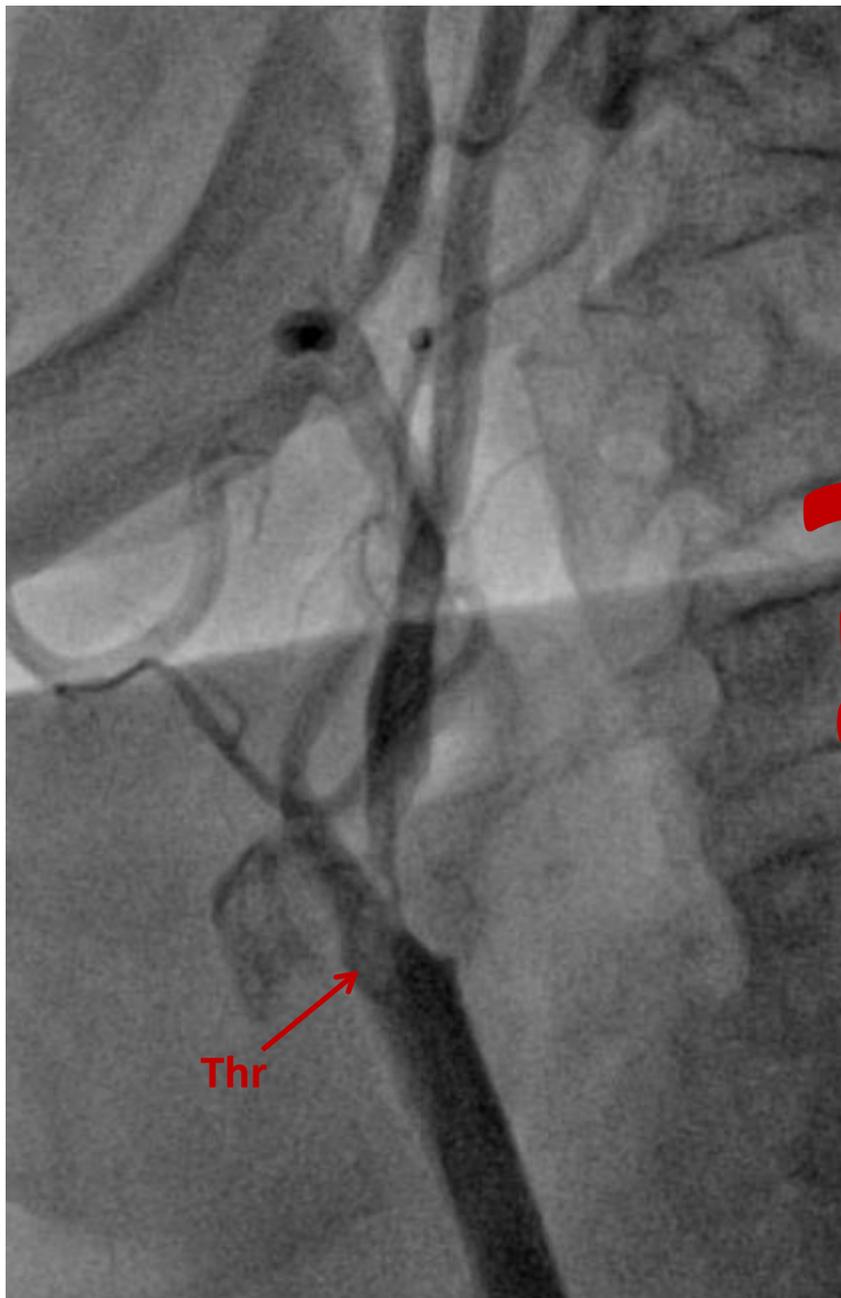


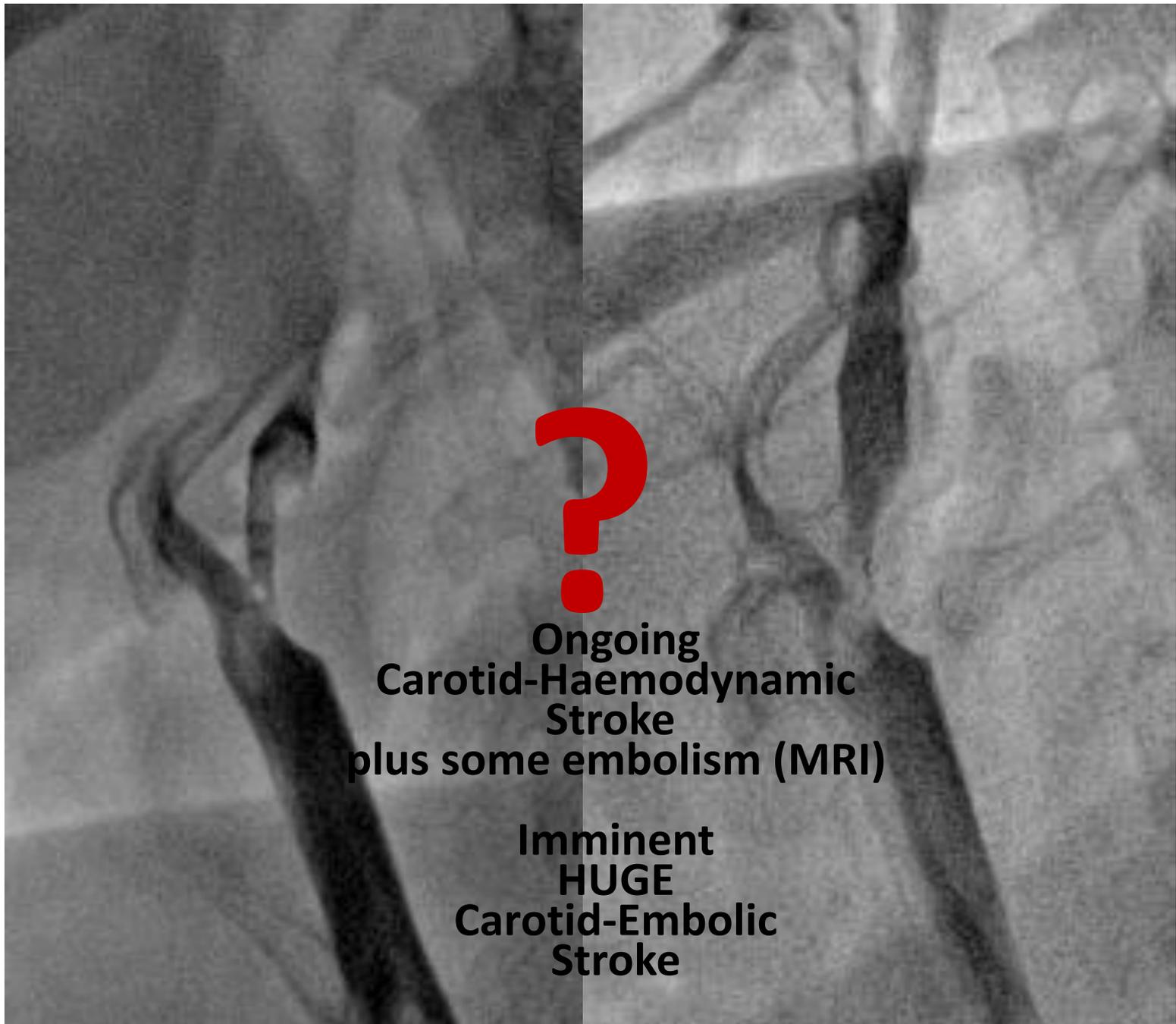






The Patient is experiencing a HAEMODYNAMIC stroke





**Ongoing
Carotid-Haemodynamic
Stroke
plus some embolism (MRI)**

**Imminent
HUGE
Carotid-Embolic
Stroke**

PARADIGM – Extend

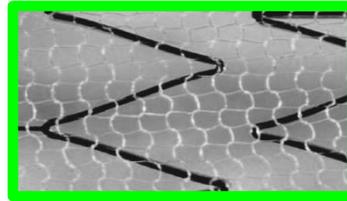
continues as an ALL-Comer Study





The Outcome Difference

Between the MicroNet-Covered Stent



vs.

Conventional Carotid Stent(s)

driven
by HIGH-RISK
Plaques and Patients

PARADIGM – Extend

continues as an ALL-Comer Study



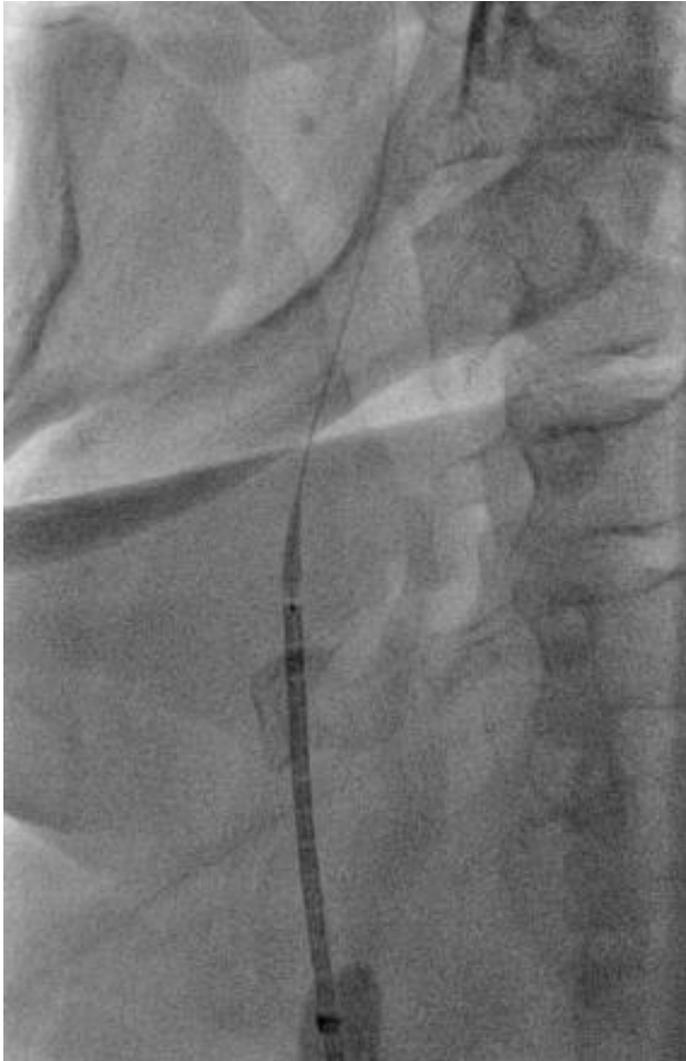
PARADIGM – Extend

continues as an ALL-Comer Study



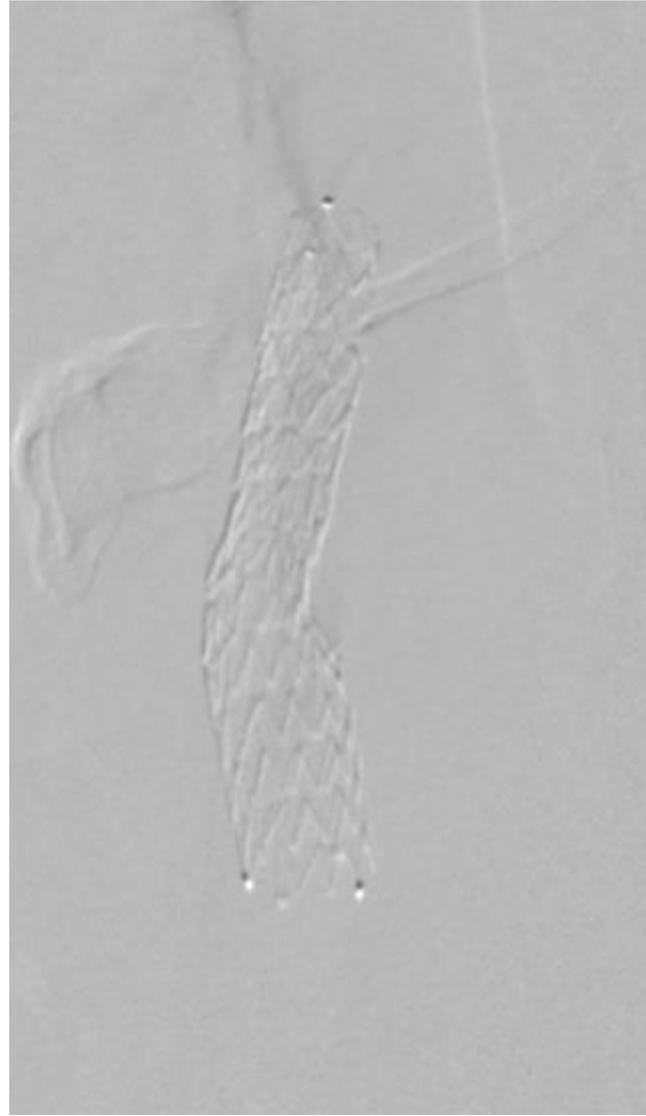
PARADIGM – Extend

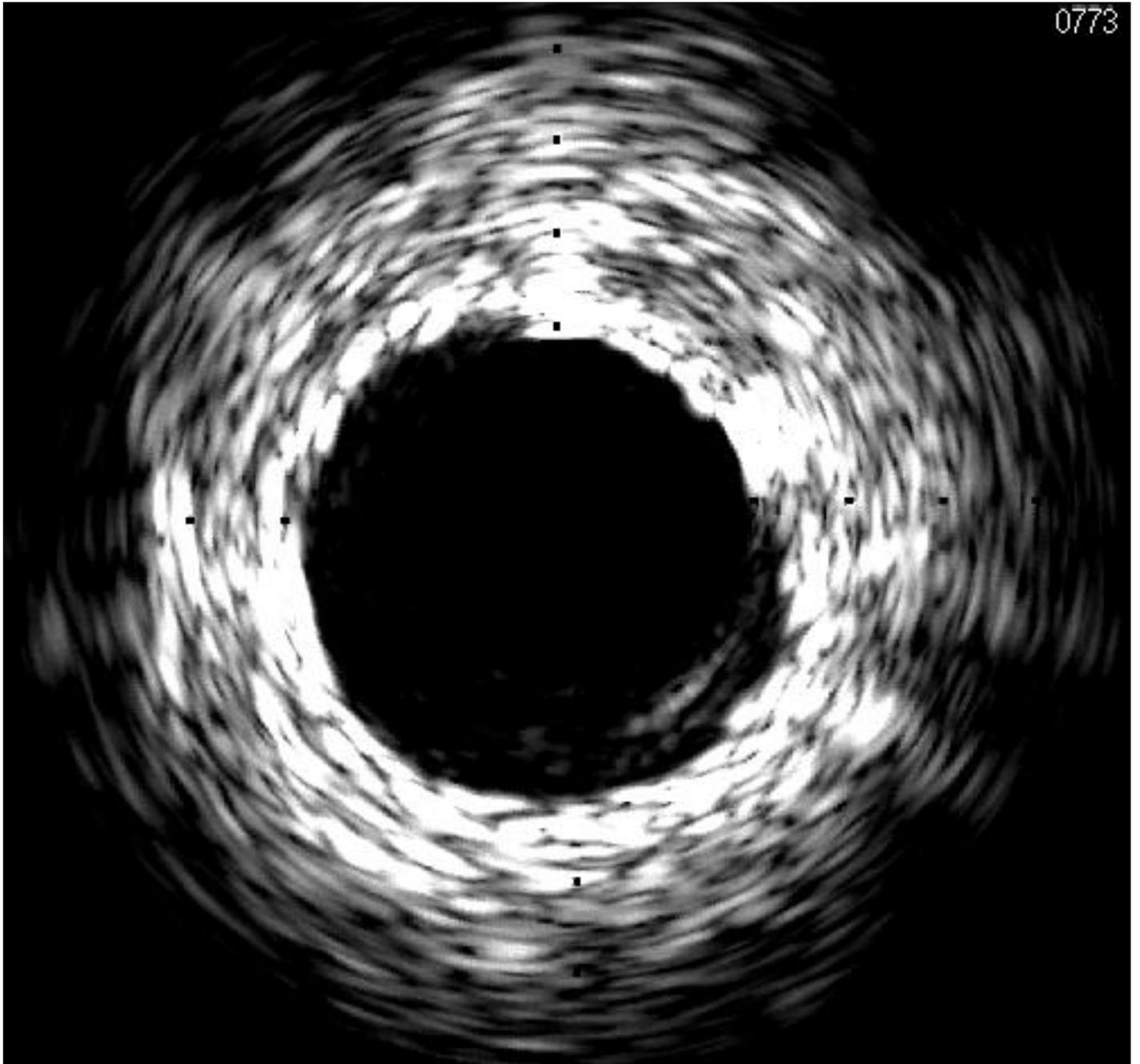
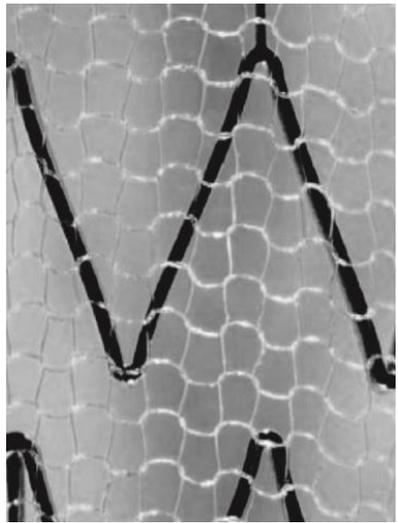
continues as an ALL-Corner Study



PARADIGM – Extend

continues as an ALL-Corner Study





PARADIGM – Extend

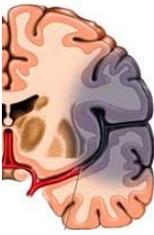
continues as an ALL-Comer Study



**Immediate
recovery**

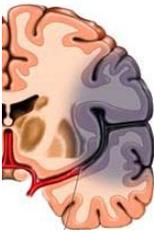


Feb 2019



- I “could” treat this patient
because his stroke ...

Feb 2019



- I "could" treat this patient

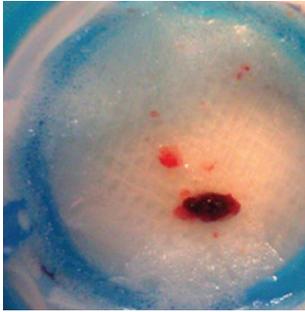
because his stroke ...

was haemodynamic

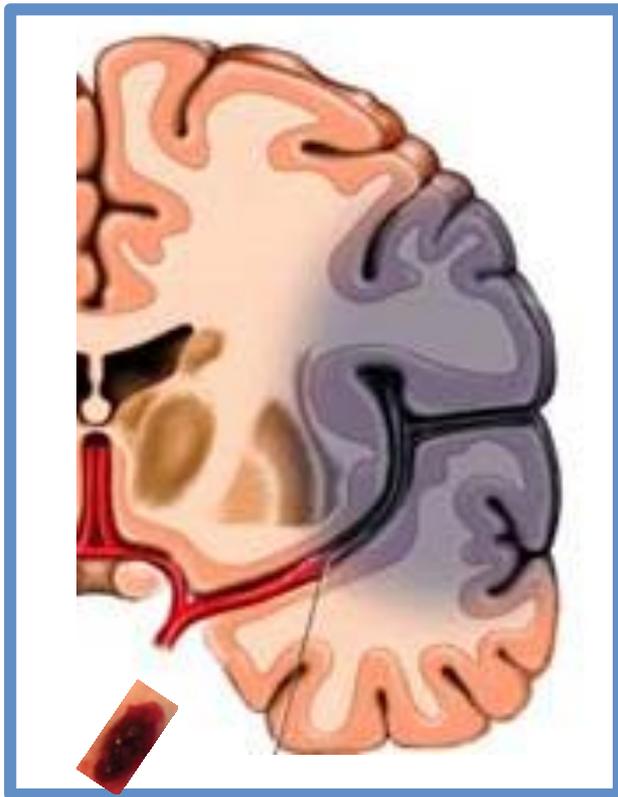
ie, had this already developed as a tandem-lesion stroke,
I would have had to arrange transfer to another center...
with ambulances in Poland not immediately available for inter-
hospital transportation ("systemic" ambulances cannot be used)

(and where I do not know whether, what and how would be done)

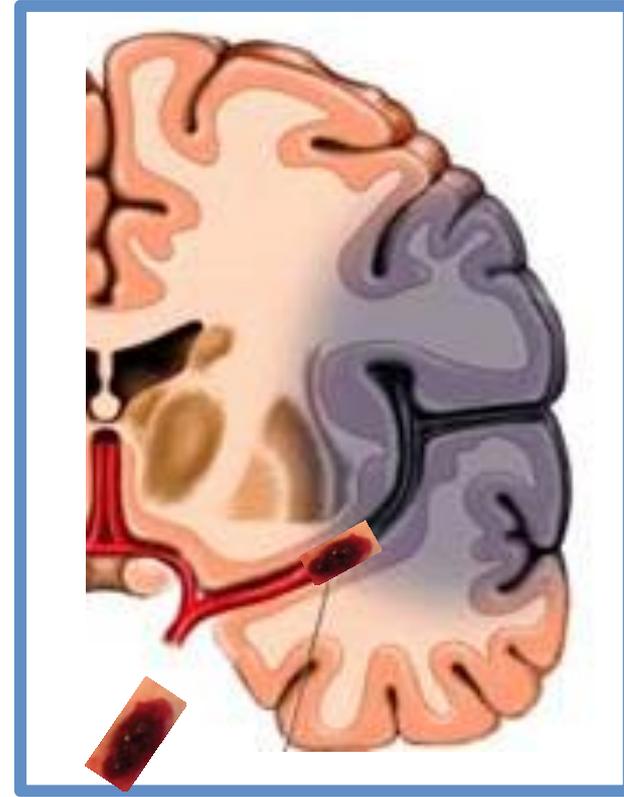
CAS under Flow Reversal



MECHANICAL THROMBECTOMY



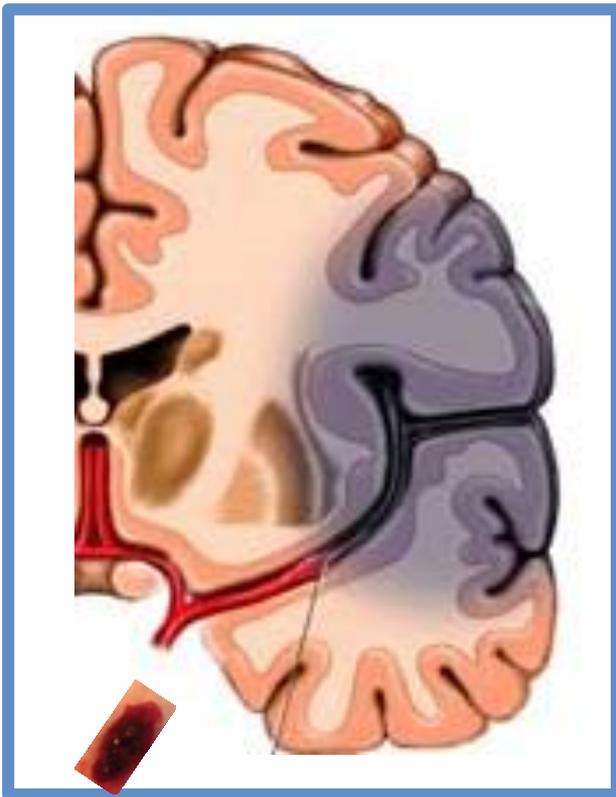
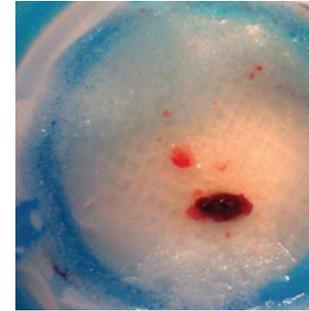
≠



CAS under Flow Reversal

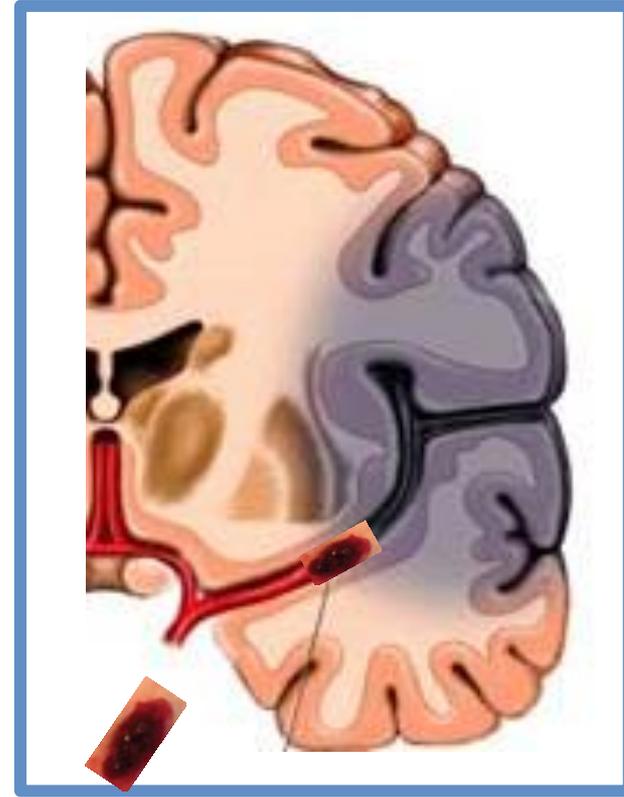


MECHANICAL THROMBECTOMY



YES

≠

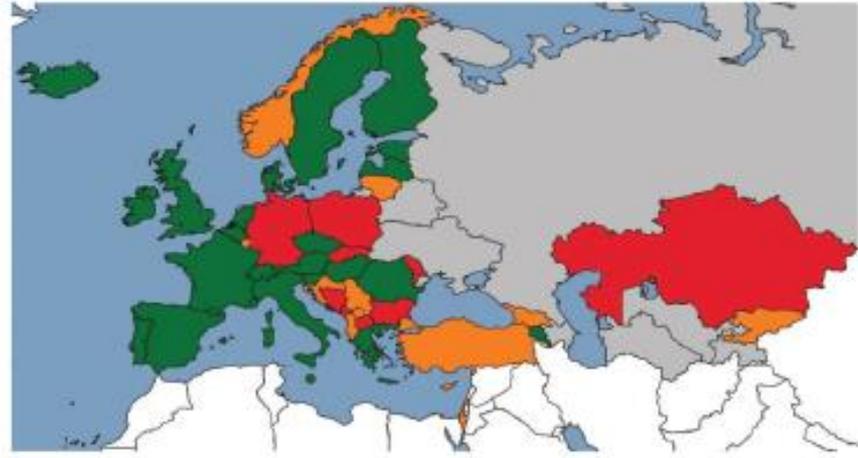


NO

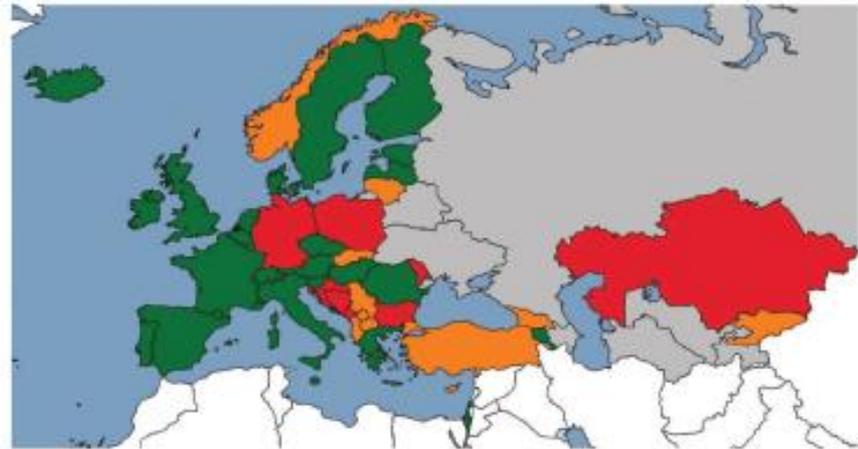
Epidemiology report: trends in sex-specific cerebrovascular disease mortality in Europe based on WHO mortality data

Rushabh Shah¹, Elizabeth Wilkins¹, Melanie Nichols², Paul Kelly³, Farah El-Sadi¹, F. Lucy Wright⁴, and Nick Townsend^{1,5*}

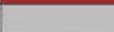
Females



Males



Key*

	Significant decrease		Significant increase
	No significant change		No data available

*Based on Average Annual Percentage Change (AAPC) for overall period

*Years of available data differ between countries

Map of trends in ischaemic stroke age-standardized mortality rates, Europe 1980–2016 (years of available data differ between countries).

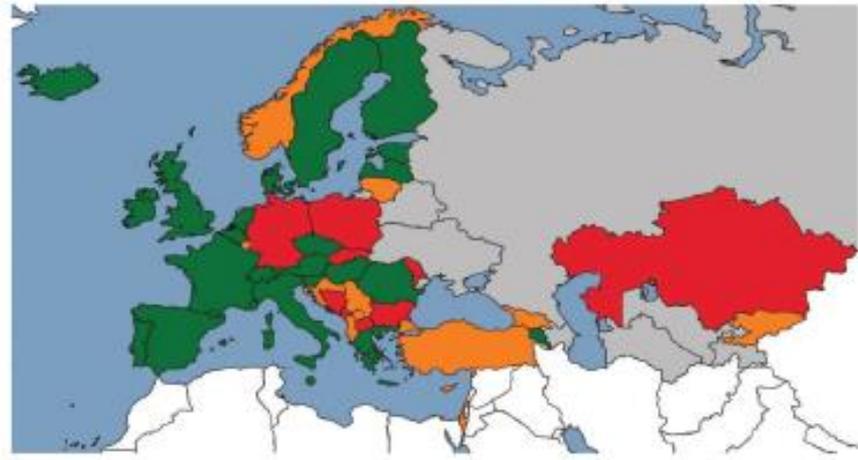
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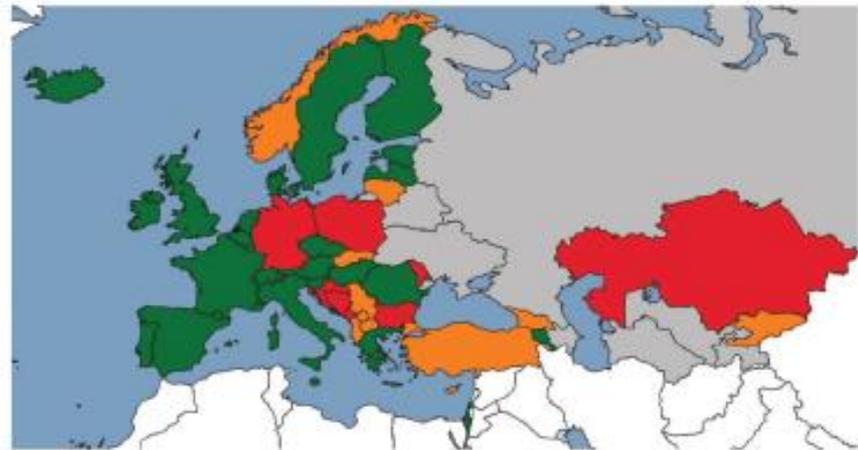
REDUCE



Females



Males



Key*

	Significant decrease		Significant increase
	No significant change		No data available

*Based on Average Annual Percentage Change (AAPC) for overall period
*Years of available data differ between countries

Map of trends in ischaemic stroke age-standardized mortality rates, Europe 1980–2016 (years of available data differ between countries).

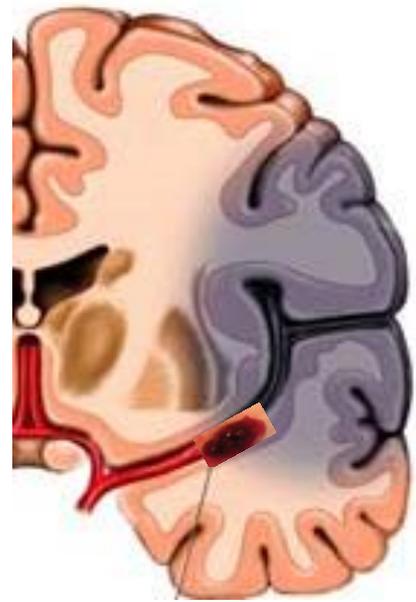
2019

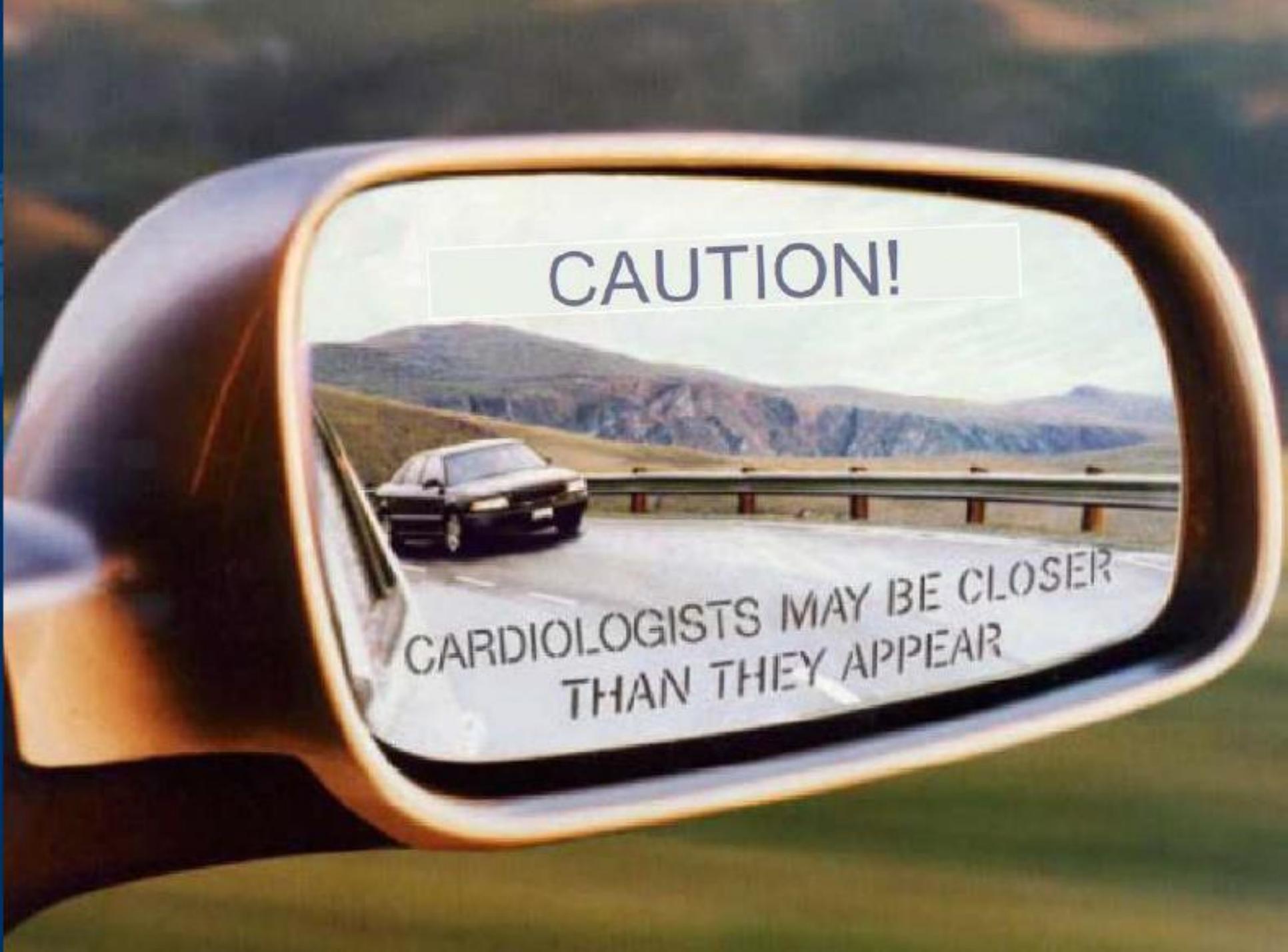
- To start TEs

others like me, and I, still need 5

”intracranial procedures”

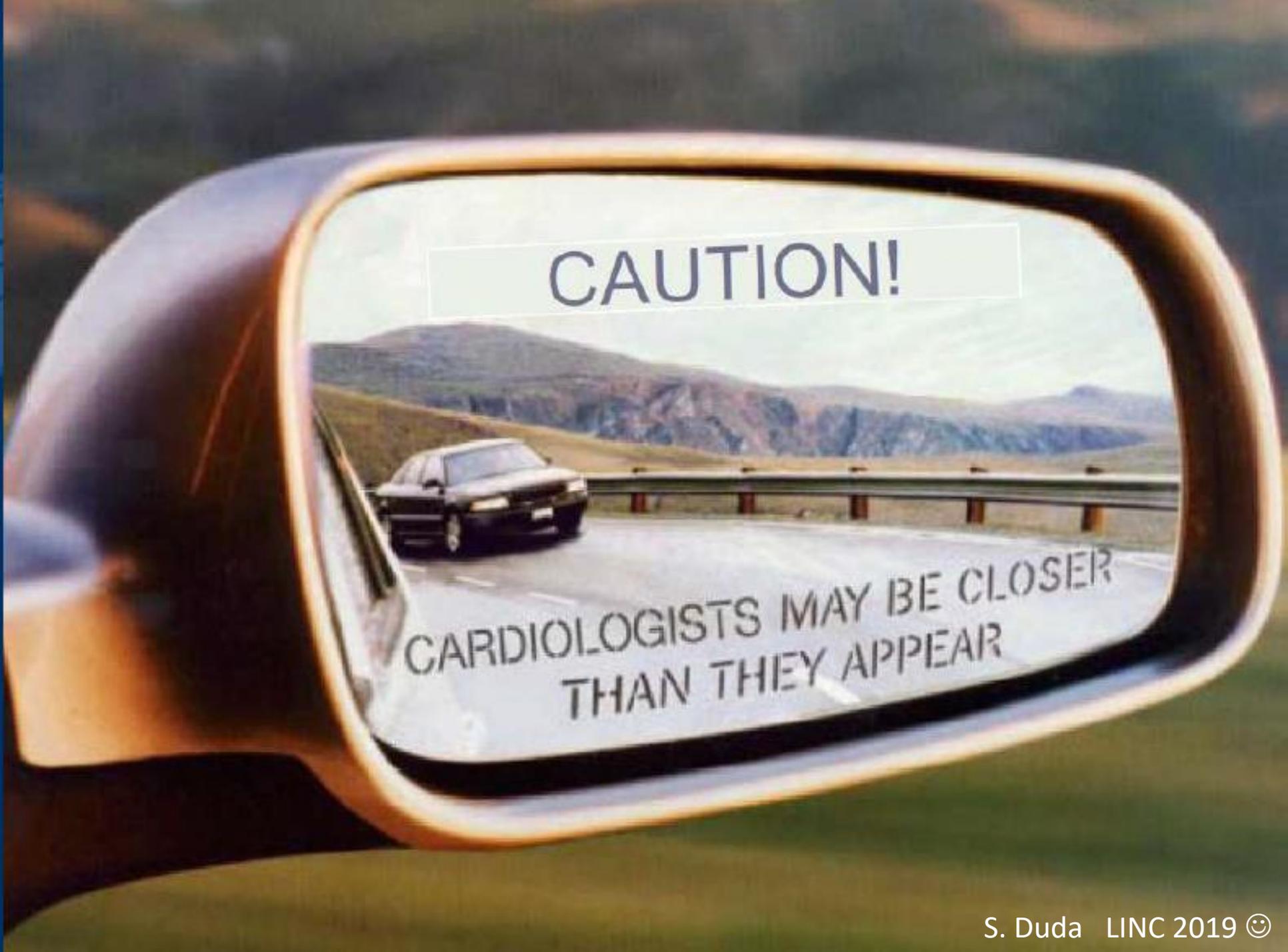
(that may be proctored)





CAUTION!

CARDIOLOGISTS MAY BE CLOSER
THAN THEY APPEAR



CAUTION!

CARDIOLOGISTS MAY BE CLOSER
THAN THEY APPEAR



Perspectives on training requirements for interventional cardiologists to perform endovascular interventions for acute ischaemic stroke



Peter Lanzer^{1*}, MD, PhD; Alberto Cremonesi², MD; Petr Widimský³, MD, DrSc

1. Mitteldeutsches Herzzentrum, Standort Klinikum Bitterfeld, Bitterfeld, Germany; 2. Department of Cardiology, University of Bologna, Bologna, Italy; 3. Cardiocenter, Third Faculty of Medicine, Charles University, Prague, Czech Republic

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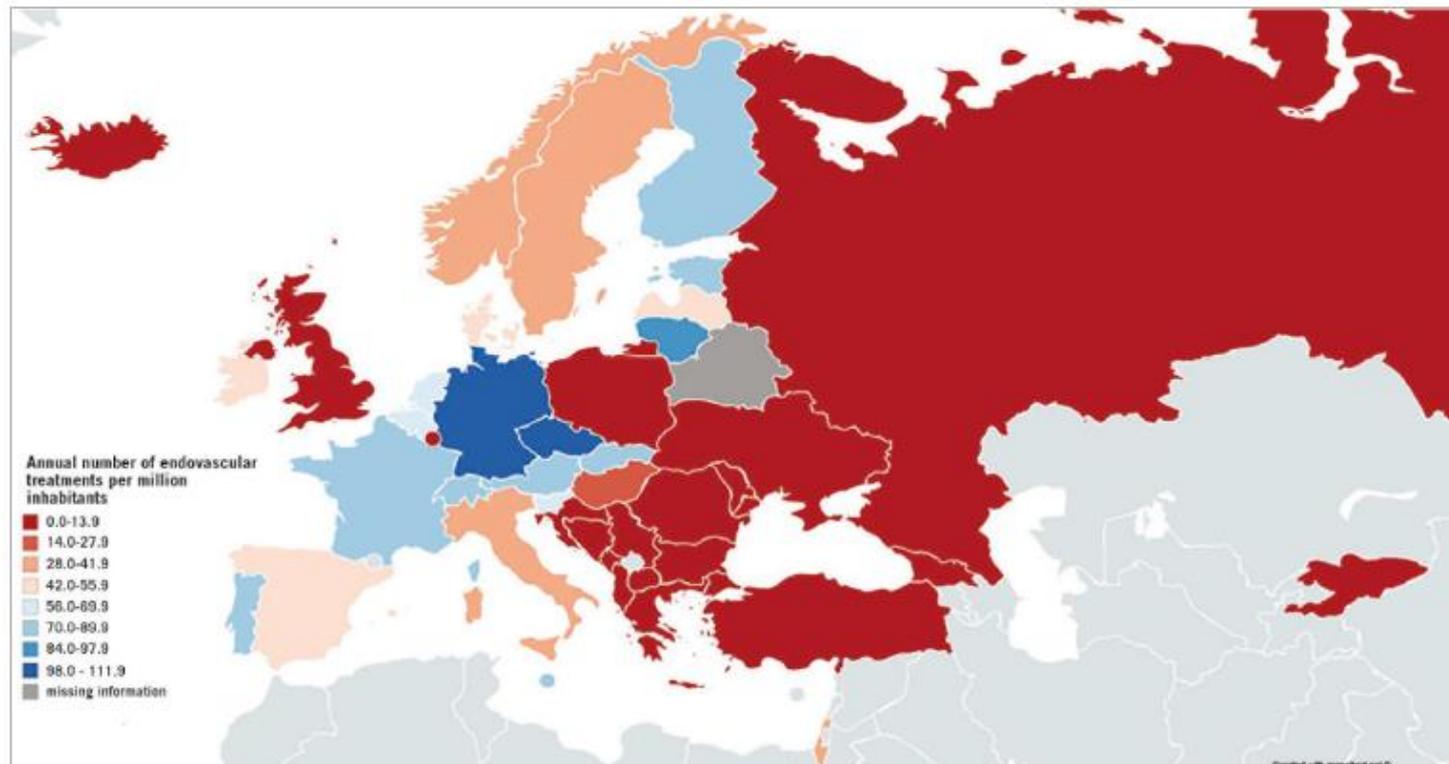


Figure 1. Map of estimated current annual rates of EMT per one million population in 43 European countries (mean 37.1, 95% CI: 26.7-47.5).

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Proposed contents of training include:

1. Supervised carotid and/or vertebral angiography (a total of ≥ 25 digital subtraction angiography [DSA] procedures as the first operator – previous documented experience included).
2. Supervised carotid stenting (a total of ≥ 25 procedures as the first operator – previous documented experience included).
3. Acute stroke thrombectomy: ≥ 20 patients (at least 10 as first operator and the remaining 10 as second operator).
4. Participation in at least ≥ 50 acute stroke hospital admissions and team decision making including neurologic evaluation, National Institutes of Health Stroke Scale (NIHSS) scoring, and cross-sectional image evaluation.
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Simulator-based training using modules designed to develop the skills required for CAS and EMT procedures can be employed and may account for up to 20% of cases required for certification.

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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

**NO on-site Neurosurgery requirement
for TE-Capable Centers**

World

Mechanical Thrombectomy

= multispecialty procedure



JACC

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

[ACC.org](#) | [Guidelines](#)

-- All Journals --



JACC Journals

Issues

Topics

Multimedia

Guidelines

Journal of the American College of Cardiology

Volume 72, Issue 13 Supplement, September 2018
DOI: 10.1016/j.jacc.2018.08.1332

 [PDF Article](#)

TCT-211 Technical Success of Acute Stroke Interventions Performed by Cardiologists – Single Center Experience

Marius Hornung, Stefan Bertog, Sameer Gafoor, Iris Grunwald, Stefan Weidauer, Kolja Sievert, Ilona Hofmann, Laura Vaskelyte and [Horst Sievert](#)

[Author + information](#)

Background

The aim of this study was to evaluate the technical success of acute stroke interventions performed in our interventional cardiology center.

World

Mechanical Thrombectomy

= multispecialty procedure



30 YEARS OF GROUNDBREAKING
SCIENCE, TRAINING, AND INNOVATION

CAROTID STENTING, STROKE PREVENTION, AND ACUTE STROKE INTERVENTION

Abstract nos: 210 - 215

TCT-210

3 Year Experience with Cath Lab based Acute Stroke Rescue
Program in a Community Hospital

Steven Guidera,¹ David Boland,¹ Joseph McGarvey,¹
Doyle Walton¹

¹Doylestown Hospital, Doylestown, Pennsylvania, United States



BACKGROUND Mechanical thrombectomy has been validated as the optimal treatment strategy for many patients with acute stroke due to large vessel occlusion. Historically, this procedure has been performed only at institutions with trained neurointerventionists (neurosurgeons with endovascular training, interventional neuroradiologists and neurologists with endovascular fellowship training). The overwhelming majority of community hospitals do not have staff physicians in these specialty groups.

CONCLUSION A community hospital stroke rescue program based in the cardiac cath lab using interventional cardiologists is feasible and can lead to good outcomes similar to those reported in the pivotal randomized trials which led to guidelines incorporating mechanical thrombectomy in the treatment of patients with large vessel occlusion stroke.

CATEGORIES ENDOVASCULAR: Stroke and Stroke Prevention

TCT-211

Technical Success of Acute Stroke Interventions Performed by
Cardiologists - Single Center Experience



Marius Hornung,¹ Stefan Bertog,² Sameer Gafoor,³
Iris Grunwald,⁴ Stefan Weidauer,⁵ Kolja Sievert,⁶ Ilona Hofmann,³
Laura Vaskelyte,³ Horst Sievert⁷

¹CardioVascular Center, Frankfurt Am Main, Germany; ²Cardiovascular Center Frankfurt, Frankfurt, Germany; ³CardioVascular Center Frankfurt, Frankfurt/Main, Germany; ⁴Anglia Ruskin University, Chelmsford, United Kingdom; ⁵Department of Neurology, Sankt Katharinen Hospital, Frankfurt, Germany; ⁶CardioVascular Center Frankfurt (CVC), Frankfurt, Germany; ⁷CardioVascular Center Frankfurt CVC, Frankfurt/Main, Germany

BACKGROUND The aim of this study was to evaluate the technical success of acute stroke interventions performed in our interventional cardiology center.

CONCLUSION Acute stroke interventions can be performed safely and with high technical success by interventional cardiologists.

CATEGORIES ENDOVASCULAR: Stroke and Stroke Prevention



Perspectives on training requirements for interventional cardiologists to perform endovascular interventions for acute ischaemic stroke



Peter Lanzer^{1*}, MD, PhD; Alberto Cremonesi², MD; Petr Widimský³, MD, DrSc

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MrCLEAN

2/3 Centres

NO on-site Neurosurgery



ICCA STROKE 2019



MrCLEAN

Thrombectomy-Capable Stroke Center



- Acute stroke team available 24/7
- Neurologist* accessible 24/7 via in person or telemedicine
- Designated stroke beds
- Sufficient diagnostic services
- Ability to provide IV thrombolytics

Minumal number of TEs: 15/1y or 30/2y (as of February 2018)

Training Guidelines for Endovascular Ischemic Stroke Intervention: An International multi-society consensus document

1. Residency training (radiology, neurology, neurosurgery)
2. > 1 yr. training
3. No minimum number of MT

J NeuroIntervent Surg 2016;**8**:989–991.

TSC - Minimum MT Number Suspended

Most stroke interventionalists in USA do not meet CAST criteria

Countries with no physician meeting CAST criteria

8 centers in RCT w/o neuroradiology training and identical results (but accredited in their respective countries)



MT – Expected Case Load

(31/100.000 per year)

USA

- 100.000 / yr needing 2000 physicians

EU

- 230.000 / yr needing 4600 physicians





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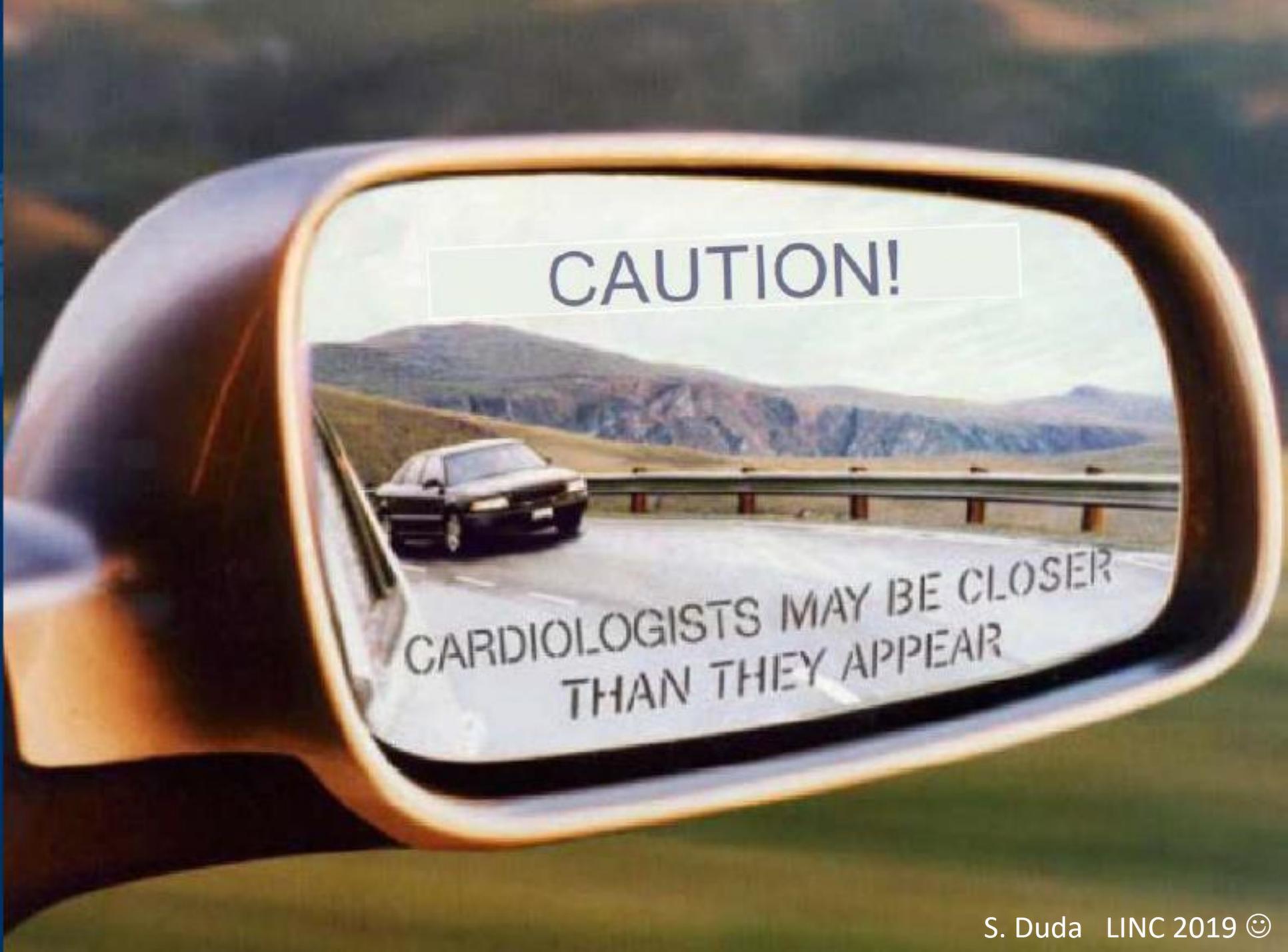
The Future

POLAND (population 38 million)

12 000 TEs / yr

needing ~ 250 operators

to bring up/maintain the stroke system up at its full operational/required capacity

A side-view mirror of a car, reflecting a road scene. In the reflection, a dark sedan is driving on a two-lane road that curves to the right. The background shows rolling hills and mountains under a cloudy sky. A metal guardrail runs along the right side of the road. Overlaid on the reflection are two text boxes. The top one is a white rectangle with the word "CAUTION!" in bold, dark blue letters. The bottom one is a white rectangle with the text "CARDIOLOGISTS MAY BE CLOSER THAN THEY APPEAR" in bold, black letters, slanted upwards to the right.

CAUTION!

**CARDIOLOGISTS MAY BE CLOSER
THAN THEY APPEAR**