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International Perspectives on Stroke Triage, Diagnosis and Treatment

Episode 4: Treatment with Thrombectomy

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Overview

- Jointly presented by ASA and SVIN
- No CEs available for webinar
- Certificate of Completion is available

Disclosures

- **Dr. Santy Ortega**: Consultant: Stryker Neurovascular and Medtronic
- **Dr. Tudor Jovin**: Member steering committee/DSMB): Cerenovus-modest; Member DSMB: Brainsgate-modest; PI DAWN, AURORA: Stryker Neurovascular; Consultant/Advisory Board: Ownership Interest: Silk Road Medical – modest; Consultant/Advisory Board: Ownership Interest: Blockade Medical-modest; Consultant/Advisory Board: Ownership Interest: FreeOx Biomedical-modest; Consultant/Advisory Board: Ownership Interest: Route 92-modest; Consultant/Advisory Board: Ownership Interest: Viz.ai-modest; Consultant/Advisory Board: Ownership Interest: Corindus; Consultant/Advisory Board: Anaconda- modest; Consultant: Medtronic-modest
- **Dr. Dileep Yavagal**: Medtronic, Neuralanalytics, Cerenovus, Rapid Medical: Consultant (Modest); TIGER study, SWIFT Prime, RECOVER-Stroke : Steering Committee Member; MR RESCUE: Investigator Steering Committee; ESCAPE: DSMB member; NIH, CTSI, Florida Biomedical State Grant, Anderson Family Gift: Grant support
- **Dr. Gisele Silva**: Brazilian Ministry of Health: Directive and Executive Committee Resilient trial; Boehringer Ingelheim: Consultant, Speaker
- **Dr. Waldo Guerrero**: none

To Ask a Question

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APPROACH TO THE LVO PATIENT BEYOND THE GUIDELINES

Tudor G. Jovin, MD

Professor and Chair
Department of Neurology
Cooper Medical School of Rowan University
Director, Cooper Neurological Institute

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WHAT DO THE GUIDELINES SAY ???

3.7. Mechanical Thrombectomy

3.7.1. Concomitant With IV Alteplase	COR	LOE	New, Revised, or Unchanged
1. Patients eligible for IV alteplase should receive IV alteplase even if mechanical thrombectomy is being considered.	I	A	Recommendation reworded for clarity from 2015 Endovascular. See Table XCV in online Data Supplement 1 for original wording.

3.7.1. Concomitant With IV Alteplase (Continued)	COR	LOE	New, Revised, or Unchanged
2. In patients under consideration for mechanical thrombectomy, observation after IV alteplase to assess for clinical response should not be performed.	III: Harm	B-R	Recommendation revised from 2015 Endovascular.

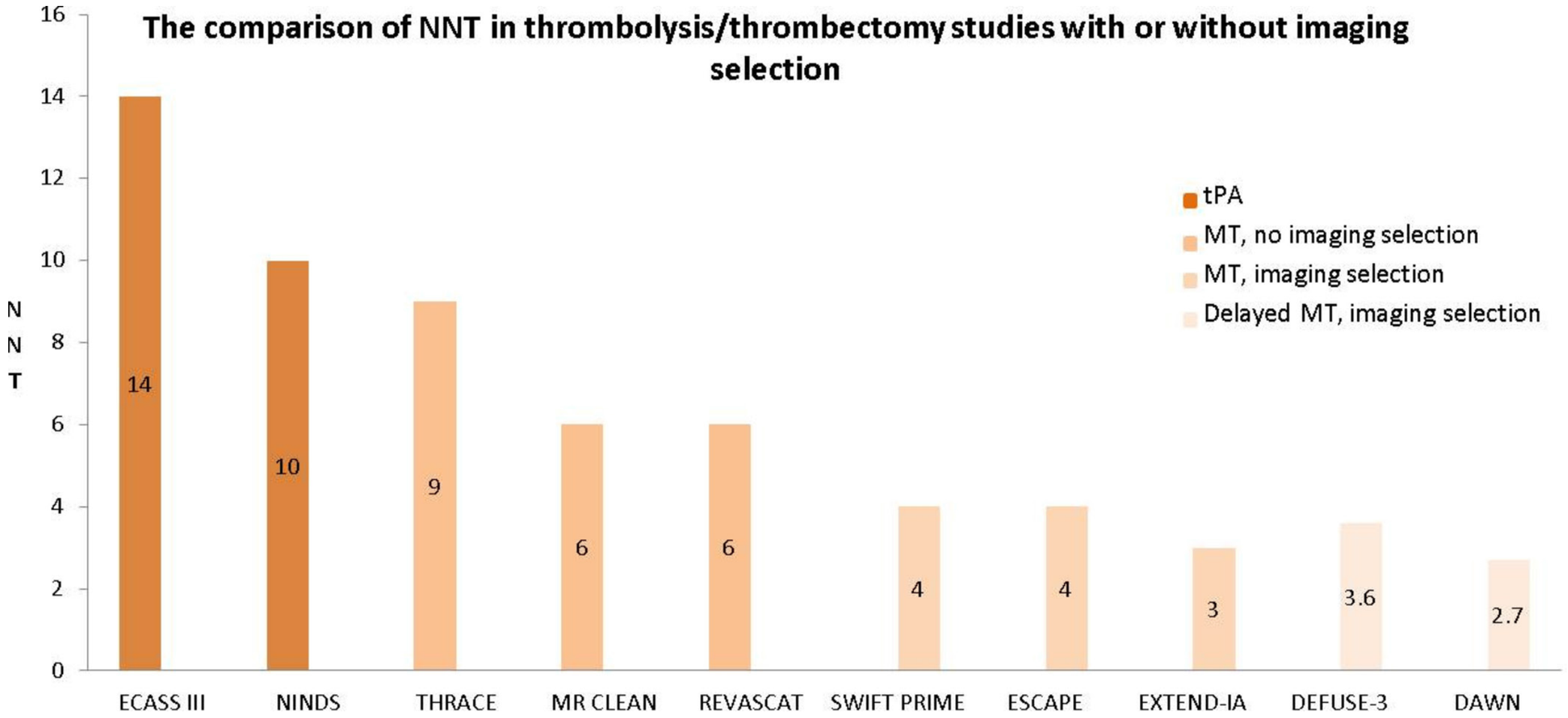
3.7.2. 0 to 6 Hours From Onset	COR	LOE	New, Revised, or Unchanged
1. Patients should receive mechanical thrombectomy with a stent retriever if they meet all the following criteria: (1) prestroke mRS score of 0 to 1; (2) causative occlusion of the internal carotid artery or MCA segment 1 (M1); (3) age ≥18 years; (4) NIHSS score of ≥6; (5) ASPECTS of ≥6; and (6) treatment can be initiated (groin puncture) within 6 hours of symptom onset.	I	A	Recommendation revised from 2015 Endovascular.

3.7.2. 0 to 6 Hours From Onset (Continued)	COR	LOE	New, Revised, or Unchanged
2. Direct aspiration thrombectomy as first-pass mechanical thrombectomy is recommended as noninferior to stent retriever for patients who meet all the following criteria: (1) prestroke mRS score of 0 to 1; (2) causative occlusion of the internal carotid artery or M1; (3) age ≥18 years; (4) NIHSS score of ≥6; (5) ASPECTS ≥6; and (6) treatment initiation (groin puncture) within 6 hours of symptom onset.	I	B-R	Recommendation revised from 2015 Endovascular.
4. Although its benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have prestroke mRS score >1, ASPECTS <6, or NIHSS score <6, and causative occlusion of the internal carotid artery (ICA) or proximal MCA (M1).	IIb	B-R	Recommendation unchanged from 2015 Endovascular.
5. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the anterior cerebral arteries, vertebral arteries, basilar artery, or posterior cerebral arteries.	IIb	C-LD	Recommendation reworded for clarity from 2015 Endovascular. COR unchanged. LOE amended to conform with ACC/AHA 2015 Recommendation Classification System. See Table XCV in online Data Supplement 1 for original wording.

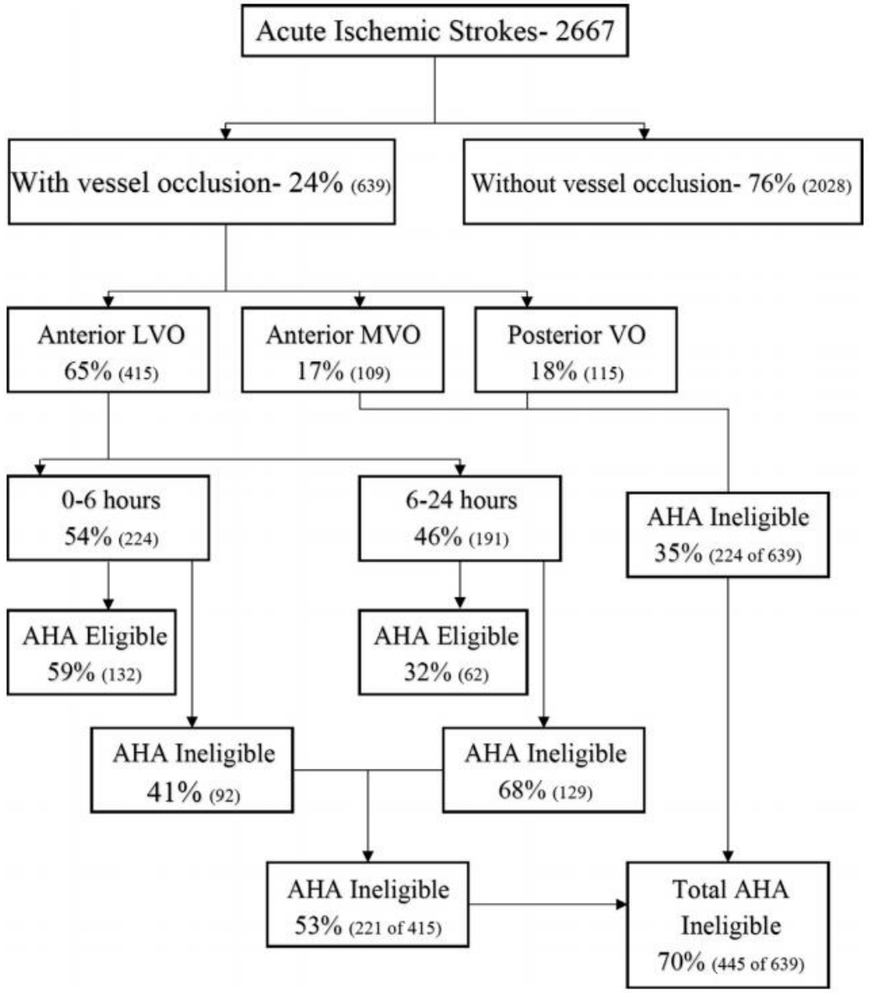
3.7.3. 6 to 24 Hours From Onset	COR	LOE	New, Revised, or Unchanged
1. In selected patients with AIS within 6 to 16 hours of last known normal who have LVO in the anterior circulation and meet other DAWN or DEFUSE 3 eligibility criteria, mechanical thrombectomy is recommended.	I	A	New recommendation.
2. In selected patients with AIS within 16 to 24 hours of last known normal who have LVO in the anterior circulation and meet other DAWN eligibility criteria, mechanical thrombectomy is reasonable.	IIa	B-R	New recommendation.
3. Although the benefits are uncertain, the use of mechanical thrombectomy with stent retrievers may be reasonable for carefully selected patients with AIS in whom treatment can be initiated (groin puncture) within 6 hours of symptom onset and who have causative occlusion of the MCA segment 2 (M2) or MCA segment 3 (M3) portion of the MCAs.	IIb	B-R	Recommendation reworded for clarity from 2015 Endovascular. COR unchanged. LOE revised. See Table XCV in online Data Supplement 1 for original wording.

Powers et al., Guidelines for the Early Management of Patients With Acute Ischemic Stroke: 2019

Are We Over-Selecting?



Thrombectomy Eligibility



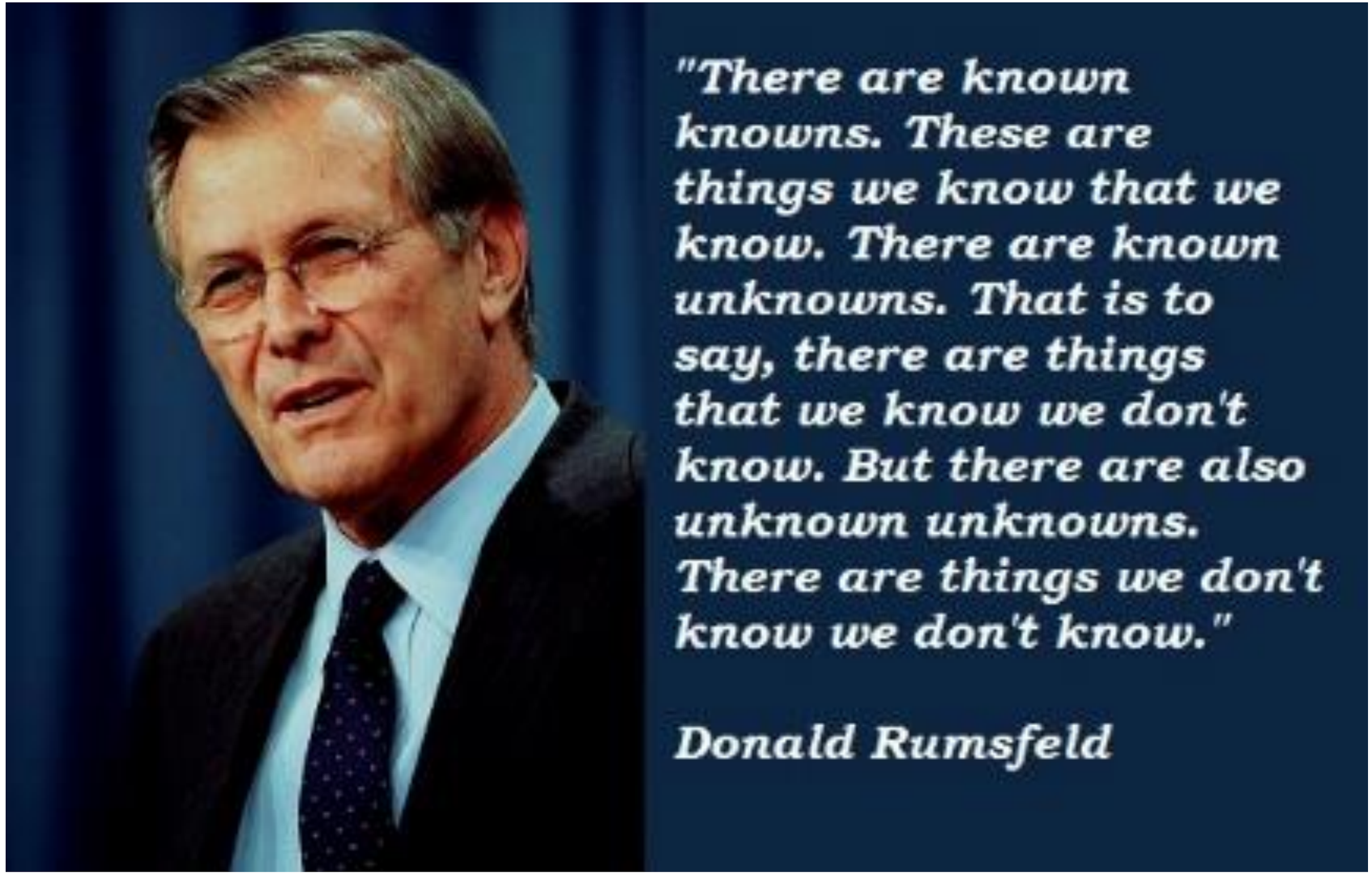
1 in 4 AISs harbor an IVO

Thrombectomy Eligibility per AHA 2018 guidelines-

- 7 in 100 AIS
- 3 in 10 AIS with vessel occlusion
- 1 in 2 AIS with internal carotid or middle cerebral artery M1 occlusion

AHA Eligibility	0-6 hours	6-24 hours	0-24 hours
All Ischemic Strokes	8.3%	5.7%	7.3%
ICA/ MCA-M1	59%	32%	47%

SM Desai, M Starr, BJ Molyneaux, M Rocha, TG Jovin... - Journal of Stroke and Cerebrovascular Diseases, 2019


"There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know."
Donald Rumsfeld

CURRENT STATE OF KNOWLEDGE (0-6 hours)

Known knowns

- Highly effective in most patients with proximal LVO (t-PA and non t-PA)
- Rate of mRS 0-2 still not good enough
- Benefit is time dependent
- Benefit is present in all subpopulations included in studies (age, gender, NIHSS, occlusion location, baseline infarct size)
- No evidence that proof of mismatch is necessary
- No major safety concerns

Known unknowns

- Harm in subpopulations (eg largest infarcts)
- Benefit in populations not studied (distal occlusions, pre-existing disability, mild stroke severity, largest infarcts, BA occlusion)
- Procedural and peri-procedural aspects (stentrievers vs aspiration, GA vs awake, BP, glucose management, adjunctive antithrombotics, primary stenting)
- Effect of advanced imaging helpful/neutral/harmful
- Need for iv thrombolysis (t-PA/TNK) at thrombectomy center

CURRENT STATE OF KNOWLEDGE (beyond 6 hours)

Known knowns

- Highly effective in patients (proximal LVO and mismatch defined by DAWN & DEFUSE 3 criteria)
- Benefit is less strongly associated with time to treatment
- Benefit is not associated with mode of presentation (wake-up vs witnessed vs unwitnessed)
- No major safety concerns

Known unknowns

- Benefit in populations not meeting DAWN/DEFUSE criteria (distal occlusions, pre-existing disability, mild stroke severity, larger infarcts, less or no mismatch, beyond 24 hours)
- Optimal imaging modality for mismatch (clinical vs perfusion, core by CT only vs CTP vs MRI)
- Harm in subpopulations (eg largest infarcts)
- Procedural and peri-procedural aspects
- Role of iv thrombolysis

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Research

International Journal of Stroke WSO

International Journal of Stroke
0(0) 1–12

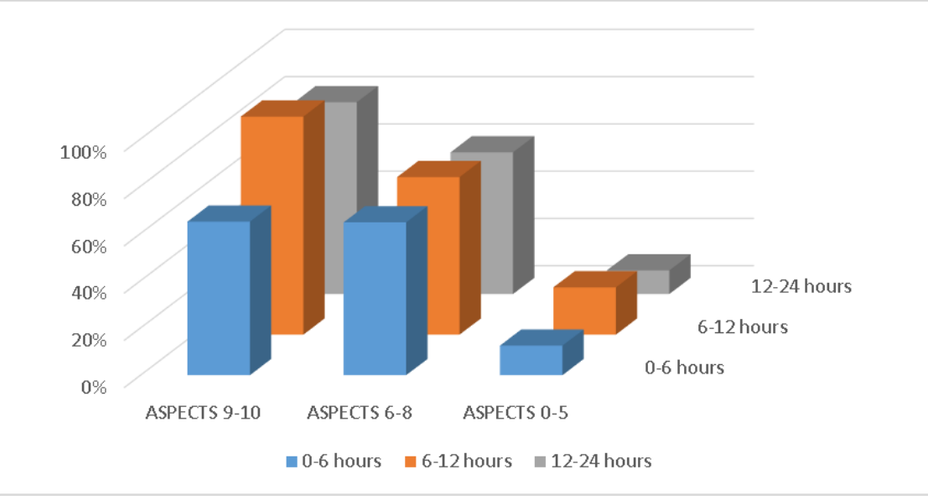
DOI: 10.1177/1747493017710341
journals.sagepub.com/home/wso
SAGE

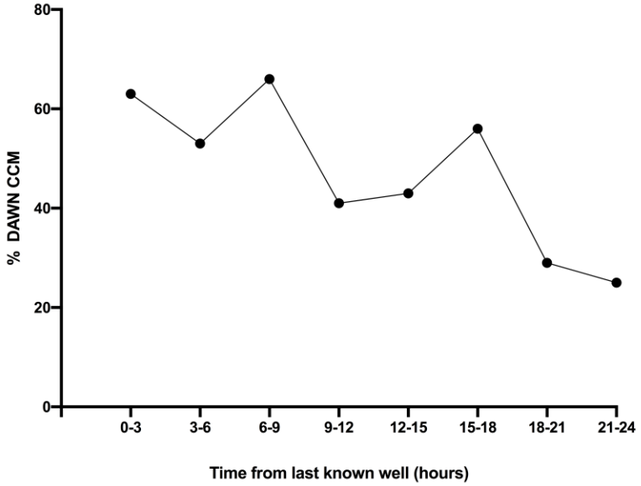
Diffusion-weighted imaging or computerized tomography perfusion assessment with clinical mismatch in the triage of wake up and late presenting strokes undergoing neurointervention with Trevo (DAWN) trial methods

Tudor G Jovin[1], Jeffrey L Saver[2], Marc Ribo[3], Vitor Pereira[4], Anthony Furlan[5], Alain Bonafe[6], Blaise Baxter[7], Rishi Gupta[8], Demetrius Lopes[9], Olav Jansen[10], Wade Smith[11], Daryl Gress[12], Steven Hetts[13], Roger J Lewis[14], Ryan Shields[15], Scott M Berry[16], Todd L Graves[16], Tim Malisch[17], Ansaar Rai[18], Kevin N Sheth[19], David S Liebeskind[2] and Raul G Nogueira[20]

DAWN may have profound implications for treatment of stroke due to LVO, because it would validate the physiological (rather than chronological) approach to patient selection for endovascular therapy. It will also allow many more patients with LVO stroke to be treated with mechanical embolectomy, especially in countries outside of the US, Australia, Canada, and Western Europe, where due to inadequate development for stroke pre-hospital systems of care, a large proportion of patients with LVO stroke present to endovascular centers outside 6 h from TLSW.

PRESENCE OF (CLINICAL CORE) MISMATCH ACROSS TIME BASED ON ASPECTS





- in the 6-24 window, 79% of ASPECTS 6-10 meet DAWN criteria
- the prevalence of CCM diminishes with time
- even at 24 hours 25% of patients with NIHSS >9 meet DAWN criteria
- proportion of positive DAWN criteria by ASPECTS category is constant in time

SM Desai, DA Tonetti, BJ Molyneaux... - Journal of NeuroInterventional Surgery, 2020

CASE SERIES

Interaction between time, ASPECTS, and clinical mismatch

Shashvat M Desai,[1] Daniel A Tonetti,[2] Bradley J Molyneaux,[3] Kunakorn Atchaneeyasakul,[1] Marcelo Rocha ,[3] Tudor G Jovin,[4] Ashutosh P Jadhav [3]

Thread

1 2 14

Tudor G. Jovin, MD
@TudorGJovin

Replying to @TudorGJovin

Bottom line: within 6-24 hrs, given NNT of 2 in DAWN, it is reasonable to assume robust benefit of thrombectomy for ASPECTS 6-10 group (80% of which meet DAWN criteria) as a whole.
LACK OF CTP/MRI SHOULD NOT BE A DETERRENT FROM THROMBECTOMY BEYOND 6 HOURS.ASPECTS IS GOOD ENOUGH.

6:01 PM · Apr 4, 2020 from Haddonfield, NJ · Twitter for Android

View Tweet activity

19 Retweets **49** Likes

SM Desai, DA Tonetti, BJ Molyneaux... - Journal of NeuroInterventional Surgery, 2020

CASE SERIES

Thrombectomy 24 hours after stroke: beyond DAWN

Shashvat M Desai,[1] Diogo C Haussen,[2] Amin Aghaebrahim,[3] Alhamza R Al-Bayati,[2] Roberta Santos,[3] Raul G Nogueira,[2] Tudor G Jovin,[1] Ashutosh P Jadhav[1]

Table 3 Outcomes

	DAWN eligible (>24 hours since TLKW) n=21	DAWN trial intervention arm n=107	P values
Procedural outcomes, n (%)			
Rates of TICI ≥2b	17 (81%)	90 (84%)	0.72
Efficacy outcomes, n (%)			
Early neurological recovery	6 (29%)	51 (48%)	0.10
mRS 0–2 at 90 days	9 (43%)	51 (48%)	0.68
Safety outcomes, n (%)			
Neurologic deterioration	2 (10%)	15 (14%)	0.57
Symptomatic ICH	1 (5%)	6 (6%)	0.87
Mortality	4 (19%)	20 (19%)	0.96

Desai, et al. JNIS 2018

I AM OUTSIDE OF CLASS I RECOMMENDATION HOW SHOULD I APPROACH THE PROBLEM ? (NOT TREATING IS ALSO AN ACTIVE DECISION)

- IS IT SAFE?
- WHAT IS MORE LIKELY (BASED ON AVAILABLE DATA) – BENEFIT/NEUTRAL/HARM?
- AM I GOING TO DEPRIVE THE PATIENT OF A GOOD OUTCOME OPPORTUNITY IF I DON'T TREAT?
- ARE THE RESOURCES JUSTIFIED (IS THIS COST EFFECTIVE)?
- DISCUSS WITH PATIENT/FAMILY

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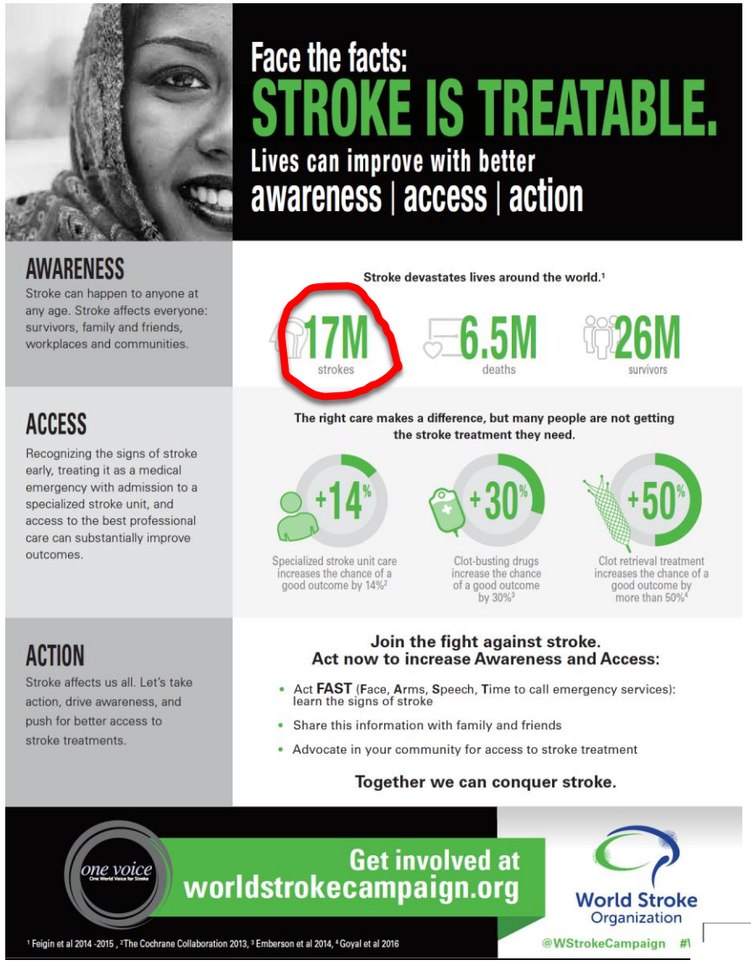
Geographical Disparities and Barriers to Mechanical Thrombectomy Access: A Global Approach to the MT Gap

Dileep Yavagal, MD

Global Co-Chair MT2020

Global Burden of Stroke: Now Substantially Modifiable in 2020



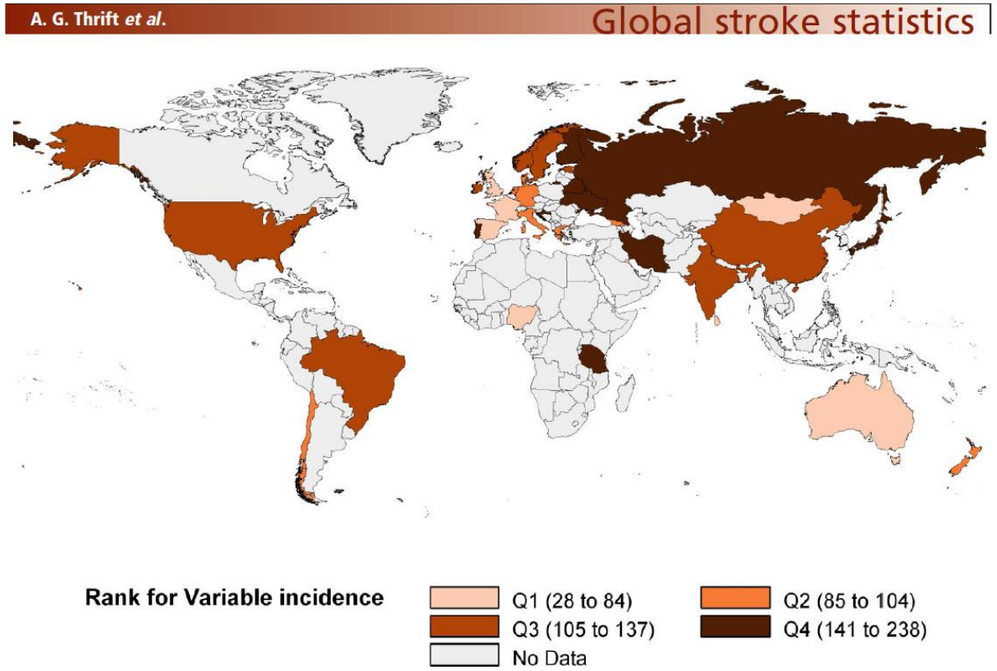


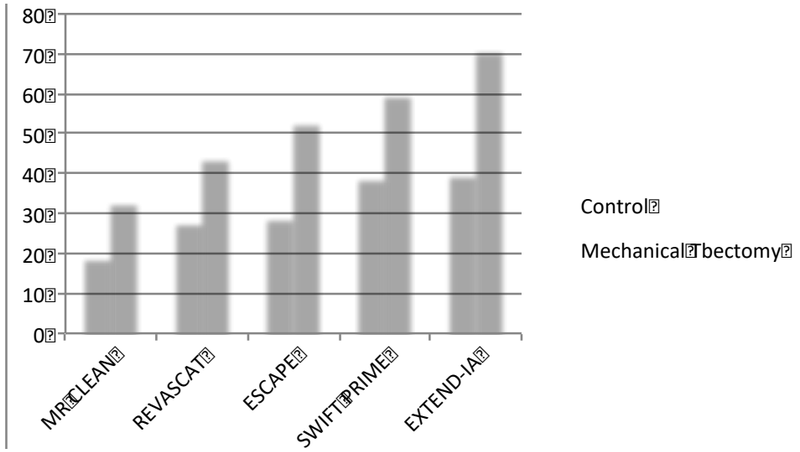
Fig. 4 Heat map showing incidence of stroke adjusted to the World Health Organization world population by quartiles (8).

Global stroke statistics

Global stroke statistics

Amanda G. Thrift[1,2*], Dominique A. Cadilhac[1,2,3], Tharshanah Thayabaranathan[1], George Howard[4], Virginia J. Howard[5], Peter M. Rothwell[6], and Geoffrey A. Donnan[2,3]

RCT Evidence for Immense Benefit of Mechanical Thrombectomy trials in Low- and Middle-Income Countries (LMIC)



ORIGINAL ARTICLE FREE PREVIEW

Thrombectomy for Stroke in the Public Health Care System of Brazil

Sheila O. Martins, M.D., Ph.D., Francisco Mont'Alverne, M.D., Ph.D., Letícia C. Rebello, M.D., Daniel G. Abud, M.D., Ph.D., Gisele S. Silva, M.D., Ph.D., Fabrício O. Lima, M.D., Ph.D., Bruno S.M. Parente, M.D., Guilherme S. Nakiri, M.D., Ph.D., Mário B. Faria, M.D., Michel E. Frudit, M.D., Ph.D., João J.F. de Carvalho, M.D., Eduardo Waihrich, M.D., Ph.D., et al., for the RESILIENT Investigators*

Mechanical Thrombectomy While Highly *Costly* is Cost-Effective

- Health-economic analysis
- Quantify the impact of developing stroke care in the country
- Estimates the impact of gradually increasing uptake of more effective **treatments over 10 years**
- Estimated **cost savings of $602 million over 15 years** ($255 million direct costs, $348 million indirect costs)

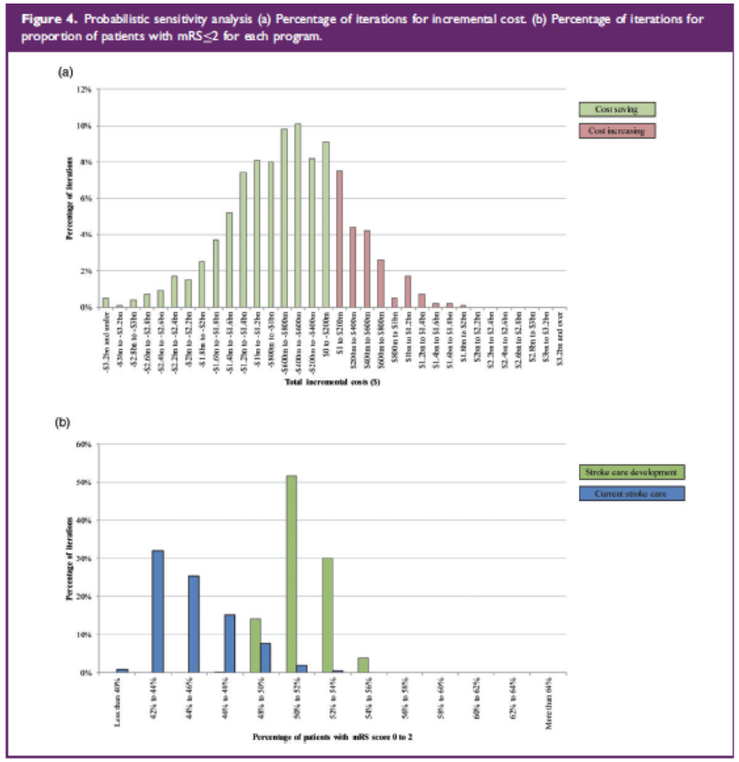


Figure 4. Probabilistic sensitivity analysis (a) Percentage of iterations for incremental cost. (b) Percentage of iterations for proportion of patients with mRS≤2 for each program.

A national economic and clinical model for ischemic stroke care development in Saudi Arabia: A call for change

International Journal of Stroke
0(0) 1–8

DOI: 10.1177/1747493019851284

The Access Gap in MT: 2016

- In 2012, Zaidat et al[1] estimated LVO to be
  - 4% to 14% of the total of 675,000 ischemic strokes in the US
- Thus MT eligible patients is the US may range from
  - 27,000 to 97,000 patients annually
- Other estimates of LVOs are approximately
  - 9% to 27% of the total, yielding estimates of 60,750 to 182,250 total LVO in the US
- Total MTs in USA estimated in 2016 was estimated to be under 20,000, a large gap between the need and MT performed
- Worldwide estimate of 10% LVO yields a staggering 1.7M LVO annually
- Total MTs worldwide in 2016: <100,000

1. Zaidat OO, Lazzaro M, McGinley E, et al. Demand-supply of neurointerventionalists for endovascular ischemic stroke therapy. Neurology 2012;79:S35–41.

Physical Access to MT in USA: Travel Distance to Thrombectomy

- Access to acute stroke intervention for LVO patients in the US in evolution over last decade[1].
- 2011: 56% of the U.S. population had access within 60 min by ground to endovascular stroke treatment-capable hospitals[2]
- Recent modeling data[3], with an assumption of addition of 20 optimally located CSCs per state, estimate that
- 63% of the U.S. population would have 60-min ground access and 83% would have 60-min ground/ air access to a CSC (57).

1. Khandelwal et al. J A C C V O L . 6 7 , N O . 2 2 , 2 0 1 6 Acute Ischemic Stroke Intervention June 7 2016 : 2631 – 4 42642
2. Adeoye O, Albright KC, Carr BG, et al. Geographic access to acute stroke care in the United States. Stroke 2014;45:3019–24.
3. Mullen MT, Branas CC, Kasner SE, et al. Optimization modeling to maximize population access to comprehensive stroke centers. Neurology 2015; 84:1196–205.

Major inequalities in acute stroke treatment between and within 44 European countries

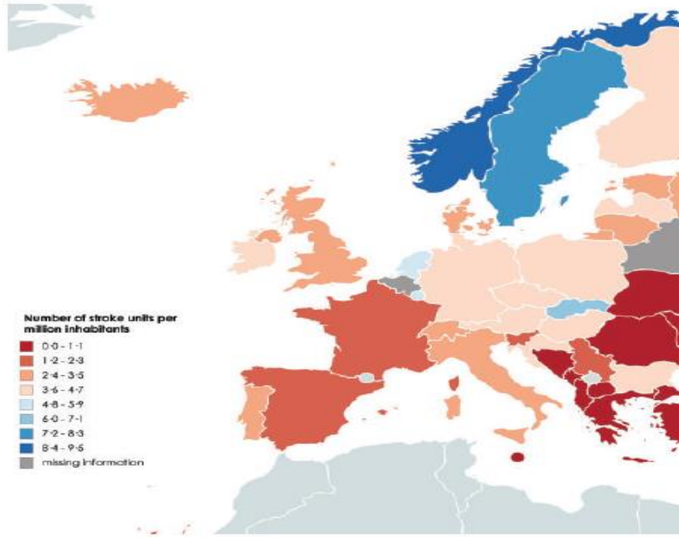


Figure 1. Choropleth map showing number of stroke units per million population in 42 European countries (mean 2.9, 95% CI 2.3–3.6).

A need to implement tailored stroke care programs for reducing stroke-related morbidity and mortality in Europe.

Delivery target

- Rate of IV t-PA=18%
- Rate of EVT=5%

Access target

- 3 stroke units / 1.000.000
- 1 comprehensive stroke centre / 1.000.000

MT 2020: Current US & World MT Procedure Estimates

MT total numbers tracking by "triangulation" method

- Sales
- Independent research organizations
- Public Hospital and Procedure Statistic Databases

US Device Industry estimates

- 2015: 10,000
- 2016: 20,000
- 2017: 32,000
- 2018: 45,000
- 2019: 48,000
- 2020: Projected 50,000-52,000

Worldwide Device Industry estimates

- 2016: 79,000
  - 22k US, 27k Europe, 30k Asia, Australia
- 2017: 106,000
  - 32k US , 30k Europe, 43k: Asia, Australia
- 2018: 156,000
- 2019: 179,000

2020: **Goal 2020,00** **Projected: 2030,00-2050,00**

*Personal communication from Medtronic. (with permission)

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SVIN: Mission Thrombectomy 2020 (MT2020)

Endovascular TODAY

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SVIN Announces Worldwide Effort to Increase Use of Mechanical Thrombectomy for Stroke

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November 30, 2016–The Society of Vascular and Interventional Neurology (SVIN) recently announced the launch of Mission Thrombectomy 2020, an initiative to enhance global

MT2020+ Mission Thrombectomy

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MT2020: Vision & Goals

To be a global, metric-driven, umbrella campaign to reduce death and disability associated with LVO ischemic stroke by accelerating access to Mechanical Thrombectomy through:

1. Integrating the disparate knowledge of barriers to MT access worldwide
2. Unify multiple efforts by local and specialty societies to accelerate MT access globally.
3. Globally double the access to MT every 2 years for the next decade.
4. Aim for a goal of 202,000 MT worldwide in 2020

MT2020+ Mission Thrombectomy

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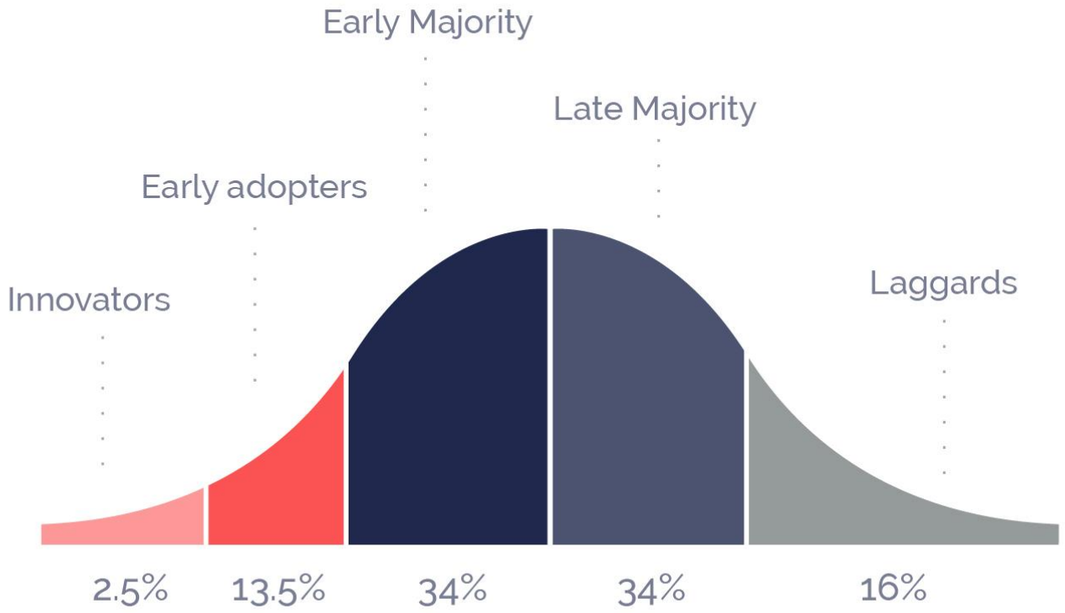
MT 2020: Outcome Metrics

1. Global Total MT = or >202,000 in 2020
2. Double access to MT <u>every 2 years</u>

MT2020+ Mission Thrombectomy

How Do Treatments Diffuse? Everett Rodgers Model

Area Under Graph Shows Percentage of Population with Access



Time and Increase in Access (percentage of population)

Access is constrained by information, facilities and physicians and financial access. Will there be enough specialists for early majority and late majority stages. How will the association control growth and be relevant?

Diffusion of Innovation. E.M. Rogers. 1964

When does a treatment need Public Health Intervention (PHI)

For a treatment to be considered in need of a public health intervention, some criteria must be met:

1) large health burden, getting larger
2) burden distributed unfairly (i.e., certain segments of the population have unequal access)
3) There is a highly effective and safe treatment for the condition
4) The treatment is cost-effective.
5) there must be evidence that upstream preventive strategies could substantially increase access to the effective treatment; and
6) such strategies are not yet in place

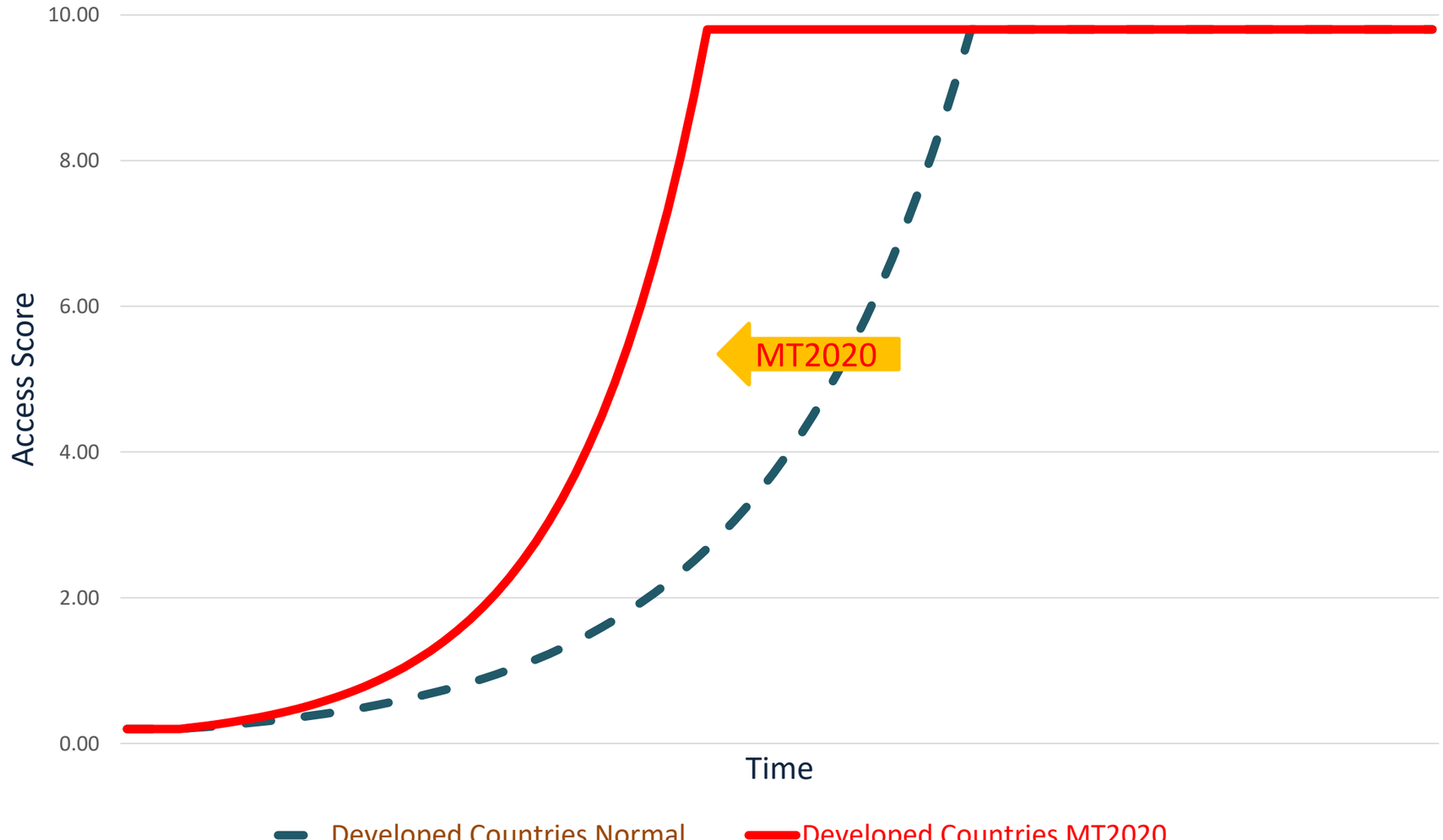
Upstream PHI Strategies to increase treatment access:

Upstream strategies:

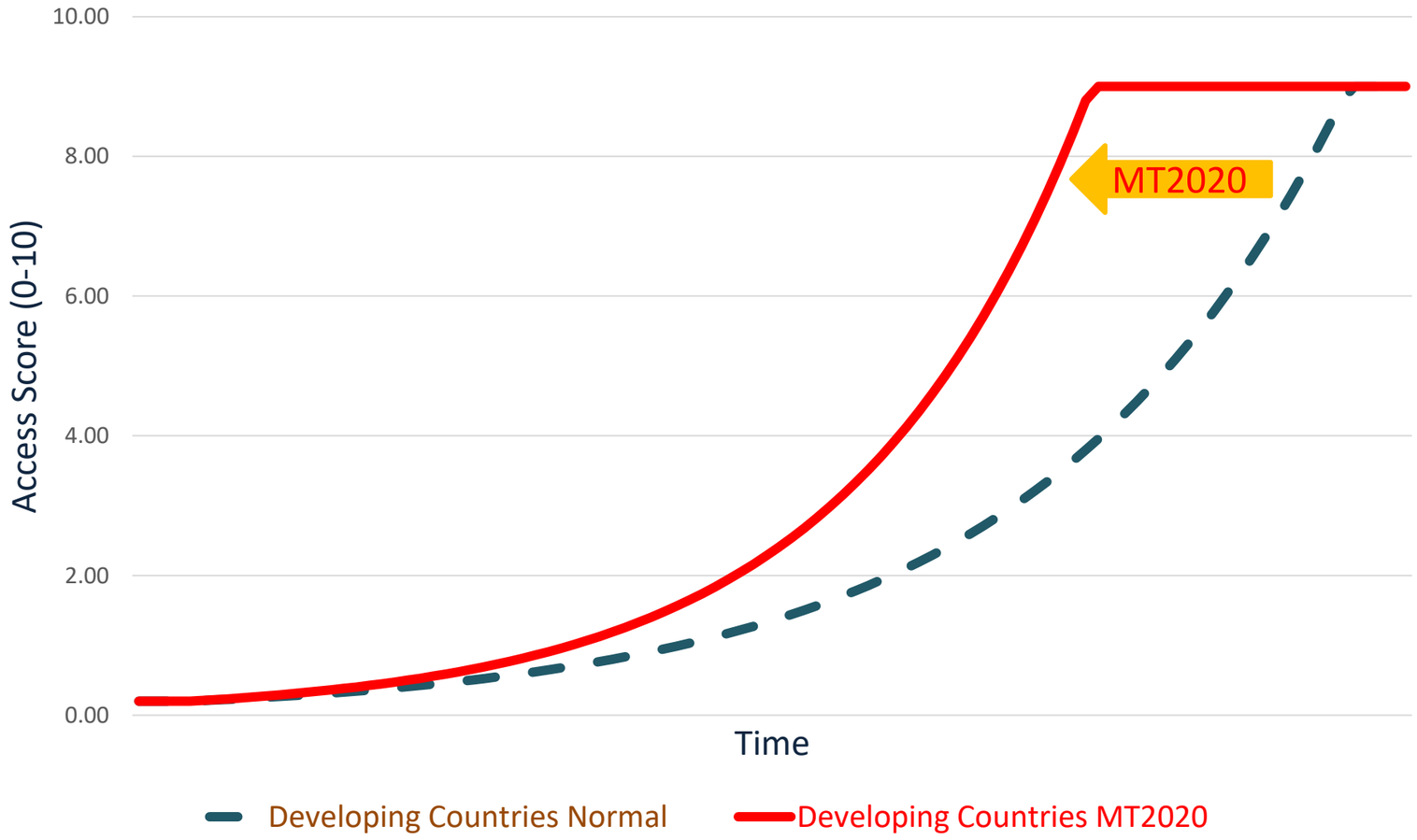
Strategies that target

- economic, political, and community factors
- that could substantially increase access to the treatment

High income Country MT Access



Low- and Middle-Income Country Access and MT2020 Goals



Patient Access Pillars

- Information and Diagnostic Access
  - availability of information about LVO and triage,
    - to specialists; general and emergency care physicians; health care professionals (EMT, nurses); hospitals; clinics; insurance firms; policy-makers; and, patients.
- Physical Access
  - ability to access Mechanical Thrombectomy procedure for LVO
    - distance to facilities; availability of specialty/expertise in the local area; availability of equipment/devices; and, driven by increased volume of patients (through protocols).
- Financial Access
  - insurance (private or public); ability to pay for MT; speed of access to payment; and, payment lag (before/at service/after service).

MT 2020 Overall Approach: Simultaneous MT Access Scoring and Intervention

MT Access Score: 3 Pillars (IPF) with 0-10 score

1. Information and Diagnostic Access
   - availability of information about LVO and triage,
     - to specialists; general and emergency care physicians; health care professionals (EMT, nurses); hospitals; clinics; insurance firms; policy-makers; and, patients.
2. Physical Access
   - ability to access Mechanical Thrombectomy procedure for LVO
     - distance to facilities; availability of specialty/expertise in the local area; availability of equipment/devices; and, driven by increased volume of patients
3. Financial Access
   - insurance (private or public); ability to pay for MT; speed of access to payment; and, payment lag (before/at service/after service).

MT Access Interventions: IPF Interventions

1. Accelerate LVO Diagnosis and Treatment Information & Awareness
2. Accelerate Physical Infrastructure for MT
3. Accelerate Financial Ecosystem for LVO MT treatment

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MT2020 Mission Thrombectomy

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- **Osama (Sam) Zaidat, MD, MSc, FSVIN**
- **Syed Zaidi, MD**
- **Ossama Yassin, MD**
- **Urs Fischer, MD**

Global Executive Committee

Core Leadership Committee

Dr Dileep R. Yavagal Chair, USA	**Dr Violiza Inoa** Coordinating Chair, USA	**Dr Ashutosh Jadhav** Vice - Chair, USA	**Dr Santiago Ortega-Gutierrez** Vice - Chair, USA	**Dr Fawaz Al-Mufti** Government Relations, USA

Co-Chairs Committee

Dr. Andrew Demchuk, Co-Chair, North America	**Dr. Carlos Molina,** Co-Chair, Europe	**Dr. Sheila Martins,** Co-Chair, LATAM	**Dr. Thomas Leung,** Co-Chair, APAC	**Dr. Ossama Mansour,** Co-Chair, MENA	**Dr. Zhongrong Miao,** Co-Chair, China	**Dr. P.N. Sylaja,** Co-Chair, South Asia	**Dr. Mehari Gebreyohanns,** Co-Chair, Sub Saharan Africa

Country Liaison

Country Liaison

Regional Sub-Committees

Region

Chair, Stroke	Board Member #1
Chair, MT	Board Member #2
	Board Member #3

Advisory Committee

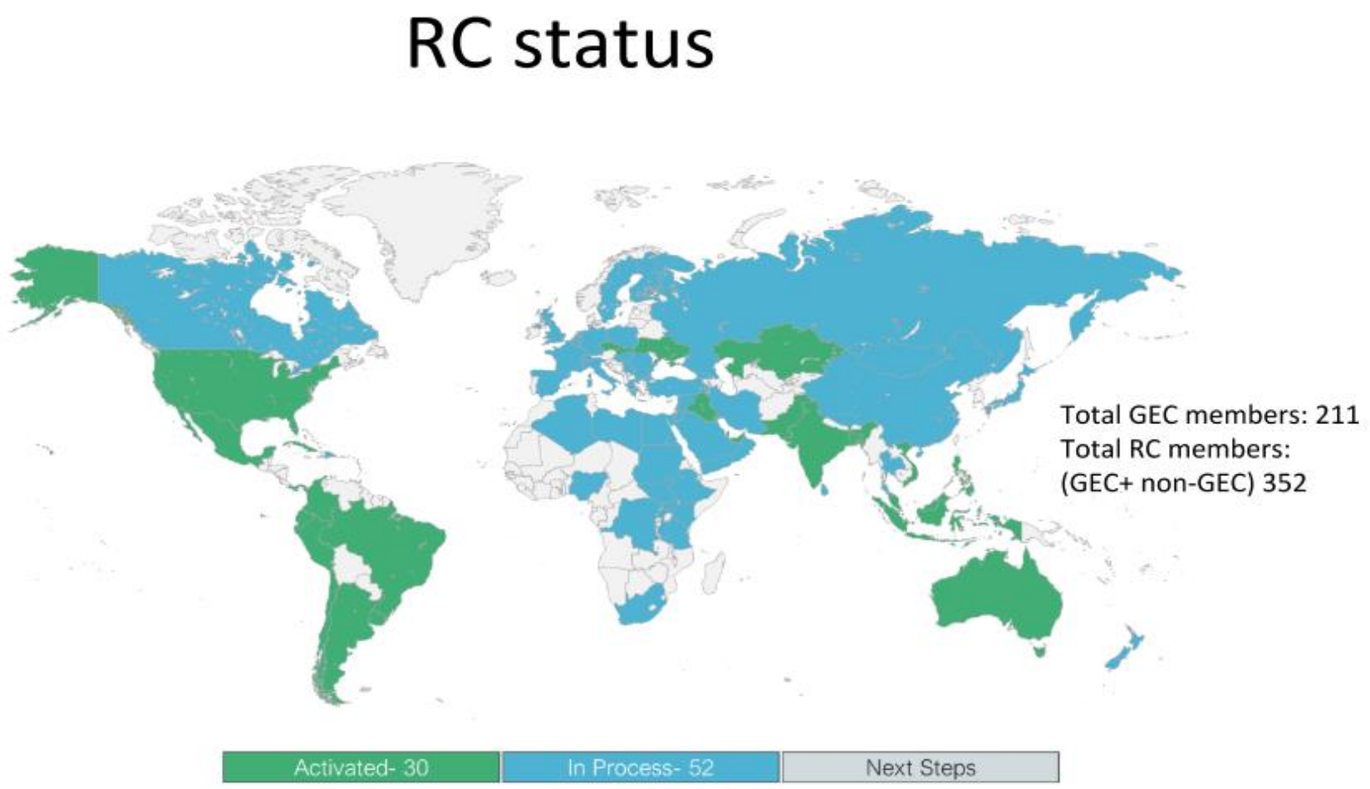
- **Society Liaisons**
  - ASA/AHA
  - ESO
  - MENA-SINO
  - WSO
  - SNIS
  - WFITN
  - ANGELS
  - RENS
- **Ralph Sacco**
- **Larry Goldstein**
- **Anne Alexandrov-** Stroke Coordinator chair
- **Sushant Arror-** Stroke Coordinator co-chair
- **Endorsing Organizations**
  - ANZ – AN
  - 5T-Stroke
  - SISS
  - KNANN
  - NCS
  - NVX
  - SNVI

PMO

- **Orbees Medical**
  Anurag Mairal, PhD
  Shyam Venkatesh, PhD
  - Project Management
  - Strategy Consultant
- **Jennifer Potter-Vig, PhD**
  - Project Manager, SVIN

MT2020+ Mission Thrombectomy

MT2020+ Regional committees launched September 2020



Region	No. of GEC members	No. of RC (GEC+ Non-GEC) members
Africa	9	16
Asia	9	16
Caribbean	11	12
China	5	7
Eastern Europe	11	14
LATAM	34	86
MENA	24	35
North America	26	59
Oceania	9	10
Russia	2	2
South Asia	37	75
South East Asia	23	37
Western Europe	11	12

MT2020 Activities Update Year to Date 2020

1. MT2020 GEC Meeting in person at ISC 2020 in LA in February 2020: 90 attendees, Update from 6 continents
2. Expansion of GEC to >200 Members Globally
    1. GEC members have formed on in process of forming Regional Committees formed or in process in **82** countries.
3. Impact of COVID-19 on Stroke Thrombectomy Survey
4. Development of MT2020 Global Stroke Coordinator Committee
5. White Paper for Health Policy Makers on **"Mechanical Thrombectomy For Acute Stroke : Building Stroke Thrombectomy Systems of Care in Your Region; Why And How? A White Paper"**, finalized.

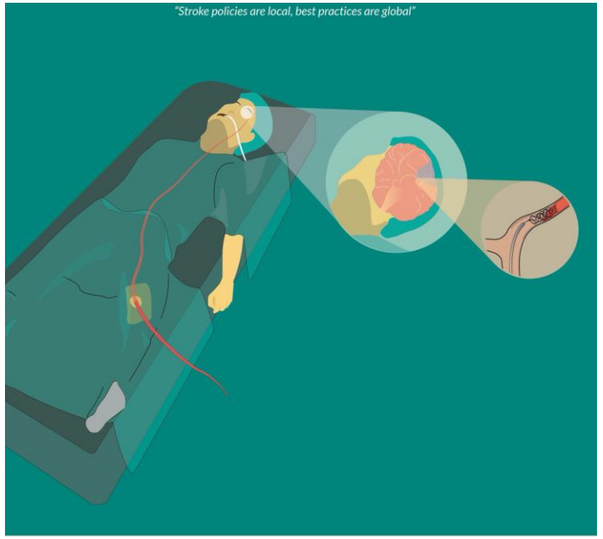
Regional Committee ACTION Plan for 2020

1. MT2020+ White Paper dissemination to local health policy members in the region.
2. Regional Survey and Analysis of MT infrastructure and volumes
3. Development and Design of Public Health Interventions (PHI) to increase thrombectomy access
    1. Plan for Implementation and Evaluation of PHI in 2021
4. Global Thrombectomy Tracking (GTT) Smartphone App Enrollment

MT2020 : 2020
#1 Global Intervention—Creating White Papers for Health Policy Makers

Objective

- Develop a White Paper that provides policy-makers with data on LVOs and why a global/national/regional and local strategy to increase Mechanical Thrombectomy is needed. There will be three versions of the report for High-Income, Low-Income and Very Low-Income Countries.



MT2020+ : 2021

#1. Patient Journey Educational Materials: (HI,LI, VLI Countries)

- Develop Stroke Patient Journey Materials (will aid in policymakers and healthcare worker education).

MT2020+: 2021

#2: Increase Infrastructure and Payment (LI, VLI countries)

A. International Thrombectomy Stroke Certification Programs: **SNVI-SVIN Self Attestation TSC Certification**

B. Develop Innovative MT Payment Methods for Low-Income Countries and Very Low-Income Countries.

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MT2020 : 2021
#3

A. White Paper in Collaboration with SNIS:

   Rural Access to Stroke Thrombectomy in the US

B. White paper in collaboration with WFITN (World Federation of Interventional and Therapeutic Neuroradiology):

   Global Demand for Mechanical Thrombectomy and Supply

MT2020+ Mission Thrombectomy

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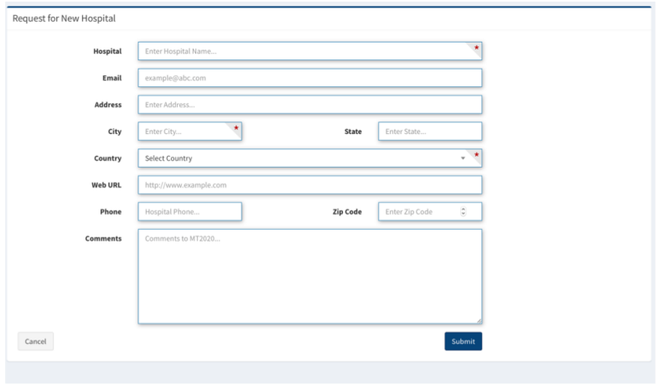
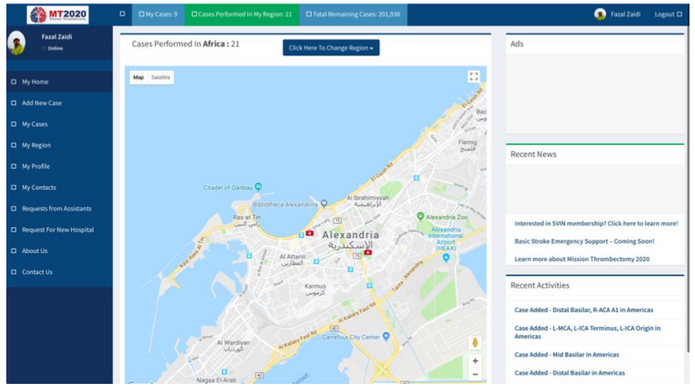
MT 2020 Smartphone App: Real-time Global and Individual Thrombectomy Tracker



- MT2020 App tracks & stores de-identified MTs performed throughout the world by individual neurointerventionalists geo-tagged to their Thrombectomy Stroke Center



- Users can keep a track of their case log with getting details of the procedures performed in their region and around the globe.

MT2020+ Mission Thrombectomy

MT 2020 Smartphone App: Download from App store

- Find it on your smartphone in iPhone or Android APP store: Search for "MT2020"
- Compatibility: Requires iOS 8.0 or later. Compatible with iPhone, iPad, and iPod touch.
- Website for app: www.mt2020.org
- Email: support@mt2020.org

MT 2020: Conclusions

1. MT 2020 is a global multi-stakeholder public health campaign to accelerate thrombectomy access for LVO stroke patients with the ultimate goal to lower the death and disability from acute ischemic stroke worldwide

2. The campaign hopes to see a goal of >2020,00 MT in one year by end of 2020
    - A feasible goal, in light of the near doubling of the number of MT from 2016 to 2018 to 100,000

MT 2020: Conclusions

3. 2019 PHI for MT2020 :
    I. White Paper on Building Thrombectomy Capacity: Why & How
    II. Patient Journey Materials,
    III. Thrombectomy Center Certification for LI and VLI countries

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SOCIETY OF VASCULAR AND INTERVENTIONAL NEUROLOGY

International Perspectives on Stroke Triage, Diagnosis, and Treatment Mechanical Thrombectomy in Brazil

Gisele Sampaio Silva
MD, PhD, MPH

Agenda

- Barriers to mechanical thrombectomy in Brazil: costs, system organization and gaps
- Opportunities to increase access to stroke treatment
- Considerations in accessing mechanical thrombectomy in various countries and regions of the world

Latin America in Numbers

Country	Area km²	Population
Argentina	2 791 810 km²	39 745 613
Bolívia	1 098 581 km²	9 627 269
Brasil	8 515 767 km²	200 104 749
Chile	756 950 km²	16 598 074
Colômbia	1 141 748 km²	44 379 598
Equador	256 370 km²	13 810 000
Guiana	214 970 km²	751 000
Guiana Francesa (França) **	86 504 km²	209 000
Ilhas Malvinas (Reino Unido) *	12 200 km²	3 060
Ilhas Geórgia do Sul e Sandwich do Sul (Reino Unido) *	4 057 km²	100
Paraguai	406 750 km²	6 100 000
Peru	1 285 220 km²	28 674 757
Suriname	163 270 km²	470 000
Uruguai	176 220 km²	3 399 237
Venezuela	916 445 km²	27 934 783

Central Intelligence Agency. The 2012 World Factbook. https://www.cia.gov/library/publications/download/download-2012/ index.html. Cited 1 November 2018

Stroke as a Cause of Death in South America

Ferri CP, Acosta D, Guerra M, Huang Y, et al. (2012) Socioeconomic Factors and All Cause and Cause-Specific Mortality among Older People in Latin America, India, and China: A Population-Based Cohort Study. PLoS Med 9(2): e1001179. doi:10.1371/journal.pmed.1001179

Neurocrit Care
https://doi.org/10.1007/s12028-019-00775-8

PROCEEDINGS

Neuroemergencies in South America: How to Fill in the Gaps?

Gisele Sampaio Silva[1*], Nelson J. Maldonado[2], Jorge H. Mejia-Mantilla[3], Santiago Ortega-Gutierrez[4], Jan Claassen[5], Panayiotis Varelas[6] and Jose I. Suarez[7] on behalf of The Galapagos Neurocritical Care Summit Investigators

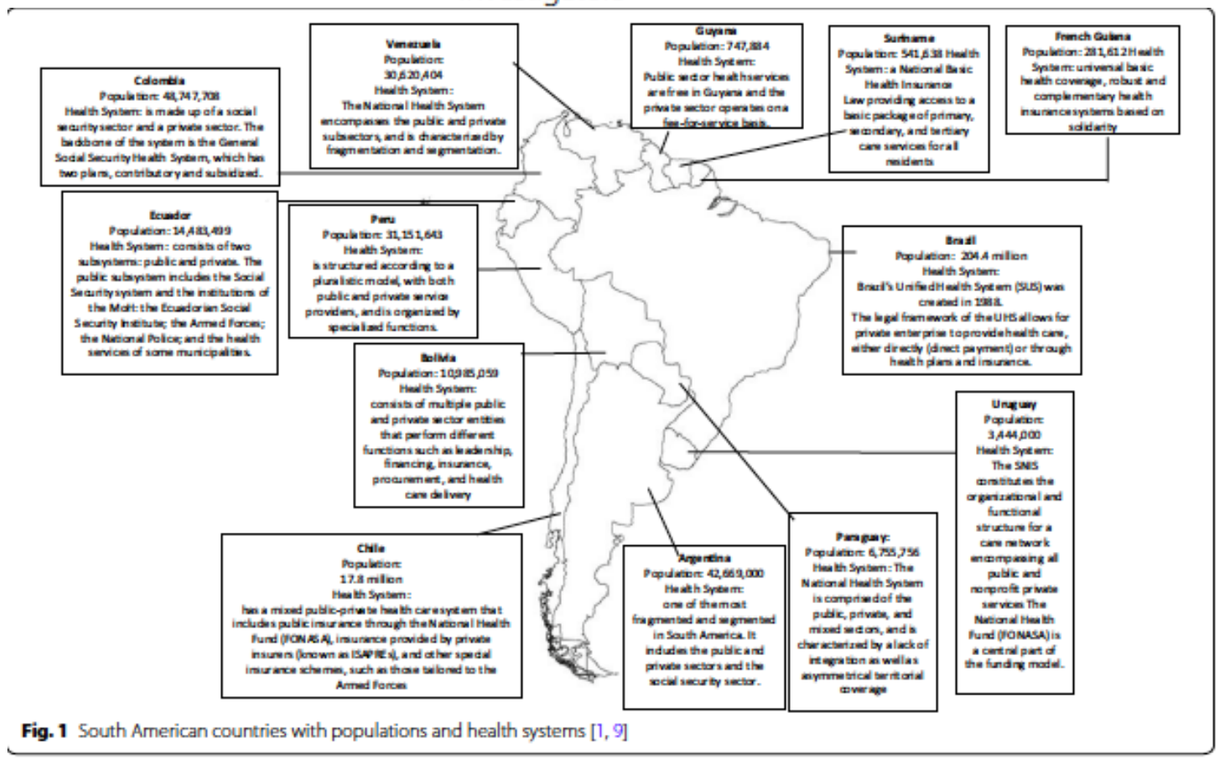

Fig. 1 South American countries with populations and health systems [1, 9]

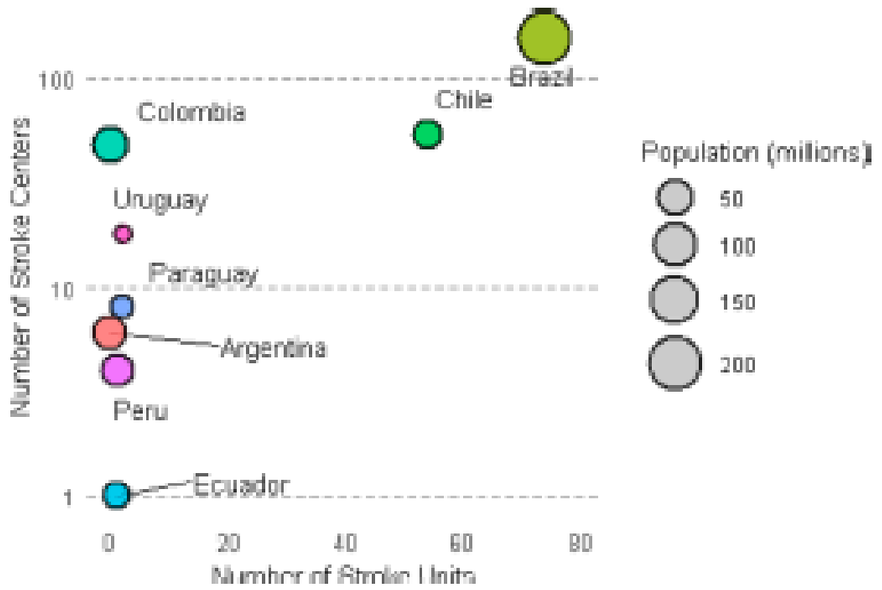

Fig. 2 Stroke centers, stroke units, and population in South American countries [12]. *No data available for Venezuela, Guyana, Suriname, and French Guiana

National Stroke Programs

Intravenous thrombolysis

Thrombectomy

Personal Communication

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Society of Vascular and Interventional Neurology

Georeferencing deaths from stroke in São Paulo: an intra-city stroke belt?

Alexandre O. Kaup[1], Bento F. C. Dos Santos[2], Elivane S. Victor[3], Adriana S. Cypriano[4], Claudio Luiz Lottenberg[2], Miguel Cendoroglo Neto[2], and Gisele S. Silva[1,5*]

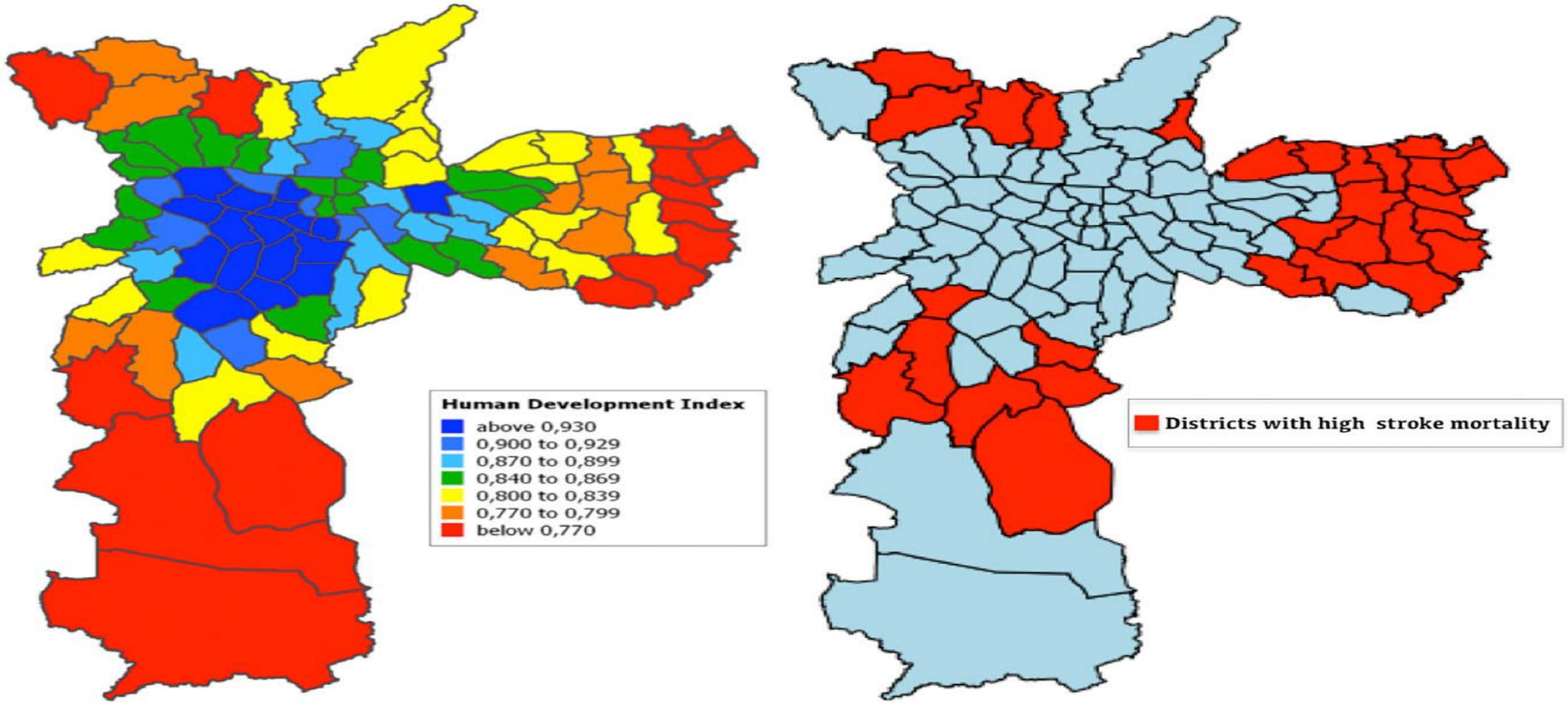

Fig. 1 Spatial visualization of districts with low human development index and high stroke mortality and in São Paulo.

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Society of Vascular and Interventional Neurology

RedeBrasilAVC

- Quem Somos
- Depoimentos
- Escalas de Avalição do AVC
- Estatuto
- Eventos
- Links Importantes
- Missão
- Nossos Parceiros
- O que é AVC?
- Para Pacientes e Familiares
- Para Profissionais de Saúde
- Projetos
- Rede de Pesquisa
- Rede Nacional de Atendimento ao AVC
- Reportagens
- Registro SITS
- Sinais de Alerta

Portoweb / Portal da Solidariedade / Rede Brasil AVC

Rede Brasil AVC

A+ A ?

busca no site

» mapa do site

» contatos

Fale Conosco

procempa

FUNCRIANÇA

Aprenda a reconhecer os Sinais de Alerta do AVC

SUSPEITA DE AVC? Não espere! Ligue 192 SAMU 192

Notícias

27/10/2009 Dia Mundial do AVC 29 de Outubro: veja o qu acontecerá no país

05/10/2009 Dia 29 de Outubro é o Dia Mundial do AVC com o tema AVC: o que eu posso fazer?

23/09/2009 Interrupção do Projeto

Dia Mundial do AVC

O AVC é a principal causa de morte no Brasil. A cada ano, retira do mercado de trabalho milhares de brasileiros e os deixa restritos a uma cama, incapazes de andar, tomar banho ou comer sem ajuda e, portanto, sem dignidade. Mas não precisava ser assim...
O AVC mata anualmente mais de

Ministério da Saúde
Gabinete do Ministro

PORTARIA Nº. 665, DE 12 DE ABRIL DE 2012

Dispõe sobre os critérios de habilitação dos estabelecimentos hospitalares como Centro de Atendimento de Urgência aos Pacientes com Acidente Vascular Cerebral (AVC), noâmbito do Sistema Único de Saúde (SUS),institui o respectivo incentivo financeiro e aprova a Linha de Cuidados em AVC.

Ministério da Saúde
Gabinete do Ministro

PORTARIA Nº 664, DE 12 DE ABRIL DE 2012

Aprova o Protocolo Clínico e Diretrizes Terapêuticas - Trombólise no Acidente Vascular Cerebral Isquêmico Agudo.

Analysis of the Cost-Effectiveness of Thrombolysis with Alteplase in Stroke

Denizar Vianna Araújo[1,3], Vanessa Teich[2], Roberta Benitez Freitas Passos[2], Sheila Cristina Ouriques Martins[3,4]

Universidade do Estado do Rio de Janeiro - UERJ[1]; MedInsight - Decisions in Health Care[2], Rio de Janeiro, RJ; Instituto Nacional de Ciência e Tecnologia para Avaliação de Tecnologias em Saúde (IATS) - CNPq[3]; Hospital de Clínicas de Porto Alegre[4], Porto Alegre, RS - Brazil

Outcome	Men			Women		
	Treatment with rt-PA	Conservative treatment	Incremental	Treatment with rt-PA	Conservative treatment	Incremental
QALY	0.47	0.41	0.06	0.47	0.41	0.06
Cost	R$ 3,219	R$ 661	R$ 2,558	R$ 2,973	R$ 661	R$ 2,312
RCEI - R$ / QALY salop			R$ 40,539			R$ 36,640

Arq Bras Cardiol 2010 Jul;95(1):12-20.

https://doi.org/10.1590/0004-282X20190059

ARTICLE

The cost of stroke in a public hospital in Brazil: a one-year prospective study

Custo do AVC em um hospital público no Brasil: um estudo prospectivo de um ano

Juliana SAFANELLI[1], Luana Gabriela Dalla Rosa VIEIRA[2], Tainá de ARAUJO[2], Lidiana Fachinete Silva MANCHOPE[2], Maria Helena Ribeiro KUHLHOFF[1], Vivian NAGEL[1], Adriana Bastos CONFORTO[3,4], Gisele Sampaio SILVA[5], Suleimy MAZIN[7], Pedro Silva Corrêa de MAGALHÃES[7], Norberto Luiz CABRAL[1]

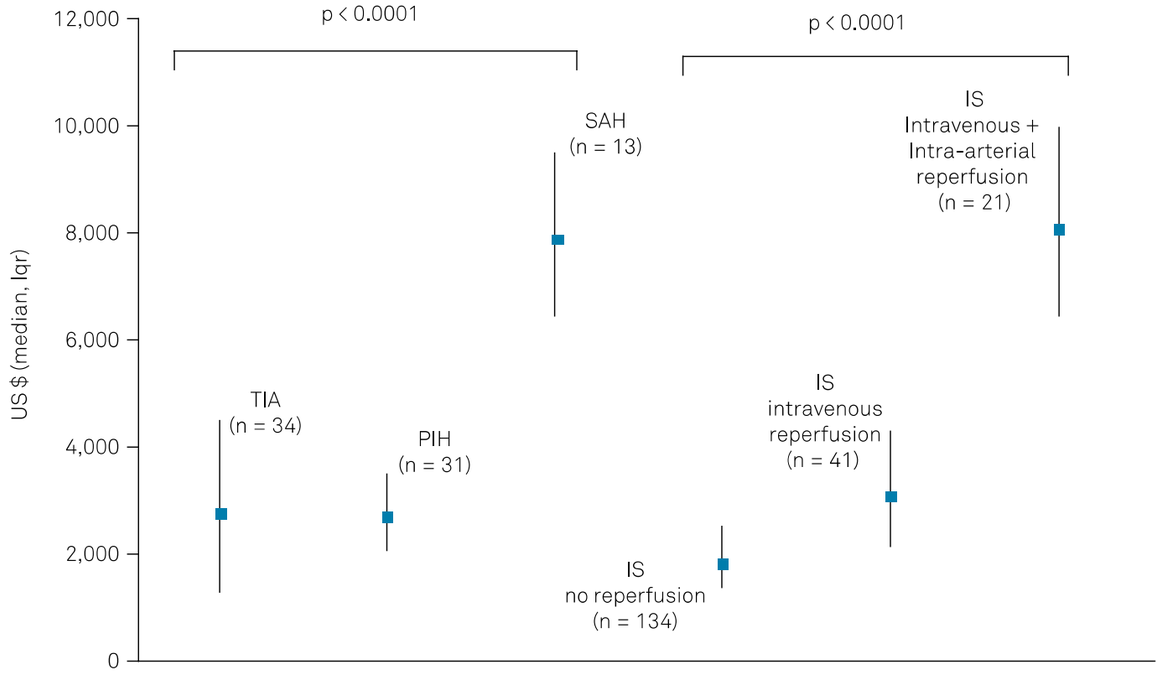

Table 4. IS treatment costs, clinical severity, LOS, and 30-day outcomes.

Title	No reperfusion (n = 134)	IV r-tPA (n = 41)	IV r-tPA + IA thrombectomy (n = 21)	p-value
Age (SD)	62 (13)	66 (14)	66 (12)	0.72
NIHSS (median, IQR)	6 (2–8)	9 (6–12)	19 (13–22)	< 0.0001
Total cost				
US$ (median, IQR)	2,803 (2,189–3,974)	5,099 (3,304–6,802)	10,997 (10,005–16,955)	< 0.0001
(mean, SD)	2,866 (1,246)	4,978 (2,527)	13,510 (6,711)	< 0.0001
Day cost				
US$ (median, IQR)	255 (199–361)	364 (236–485)	846 (769–1,304)	< 0.0001
(mean, SD)	261 (113)	356 (181)	1,039(516)	< 0.0001
LOS (mean, SD)	11 (5)	14 (14)	13 (12)	0.11

https://doi.org/10.1590/0004-282X20190059

ARTICLE

The cost of stroke in a public hospital in Brazil: a one-year prospective study

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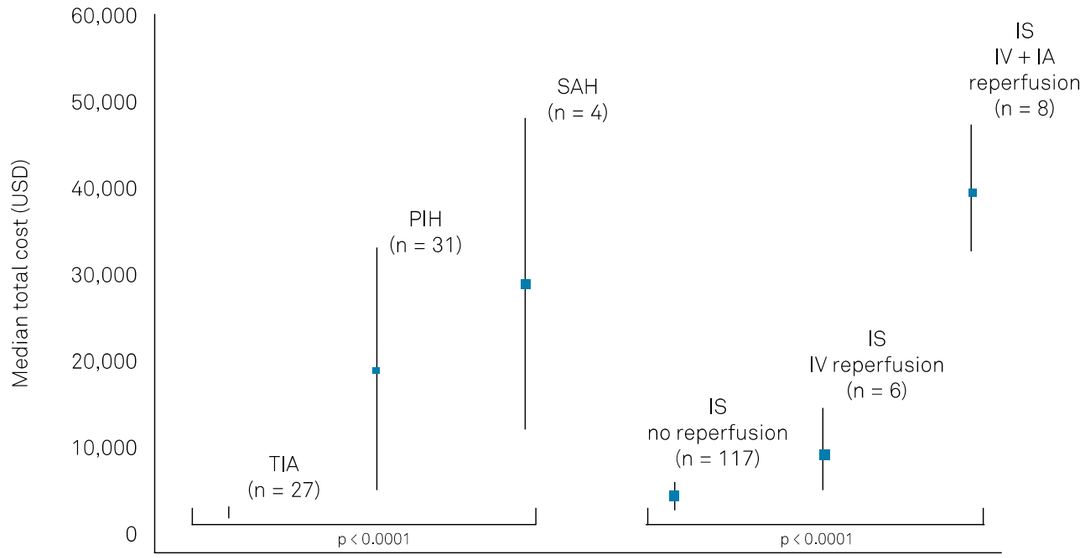
Juliana SAFANELLI[1], Luana Gabriela Dalla Rosa VIEIRA[2], Tainá de ARAUJO[2], Lidiana Fachinete Silva MANCHOPE[2], Maria Helena Ribeiro KUHLHOFF[1], Vivian NAGEL[1], Adriana Bastos CONFORTO[3,4], Gisele Sampaio SILVA[5], Suleimy MAZIN[7], Pedro Silva Corrêa de MAGALHÃES[7], Norberto Luiz CABRAL[1]



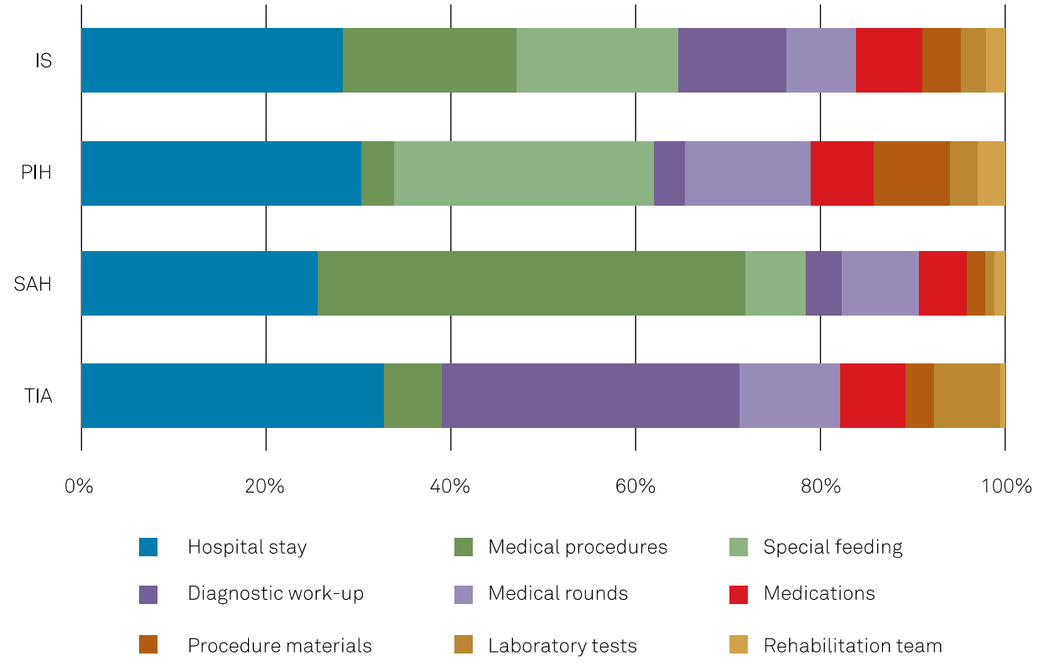


Table 4. Unit costs and average composition of costs per stroke type.

Item cost	Unit costs	IS (n=131)	PIH (n=11)	SAH (n=4)	TIA (n=27)
Hospital-stay					
Nursering	292	268,122	21,920	8,213	7,894
Intensive care days	762	99,876	45,744	22,833	...
Medical rounds	47	84,443	29,155	10,161	5,064
Emergency room rounds	55	8,910	1,217	221	2,048
Emergency room rate	30	3,898	327	119	803
Medical procedures*	3,257	219,590	5,196	48,243	1,707
Thrombectomy IA	16,308	130,467	...	...	...
Physical/Occupational therapy	15	15,914	5,786	1,215	263
Speech therapy	14	8,919	640	218	66

ORIGINAL CONTRIBUTIONS

STROKE AWARENESS IN BRAZIL

Alarming Results in a Community-Based Study

Octávio Marques Pontes-Neto, MID; Gisele Sampaio Silva, MD, PhD; Markey Ribeiro Feitosa, MD; Nathalie Lôbo de Figueiredo, MD; José Antonio Fiorot, Jr, MD; Talitha Ney Rocha; Ayrton Roberto Massaro, MD, PhD; João Pereira Leite, MD, PhD

28 ##### Stroke denominations

22% Did not recognize a single sign or symptom

Only **34,6%** Knew SAMUs number

1. Stroke. 2008;39:292-296

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SAMU SCALE

1. Adaptado de: http://redebrasilavc.org

DOI: 10.1590/0004-282X20160174

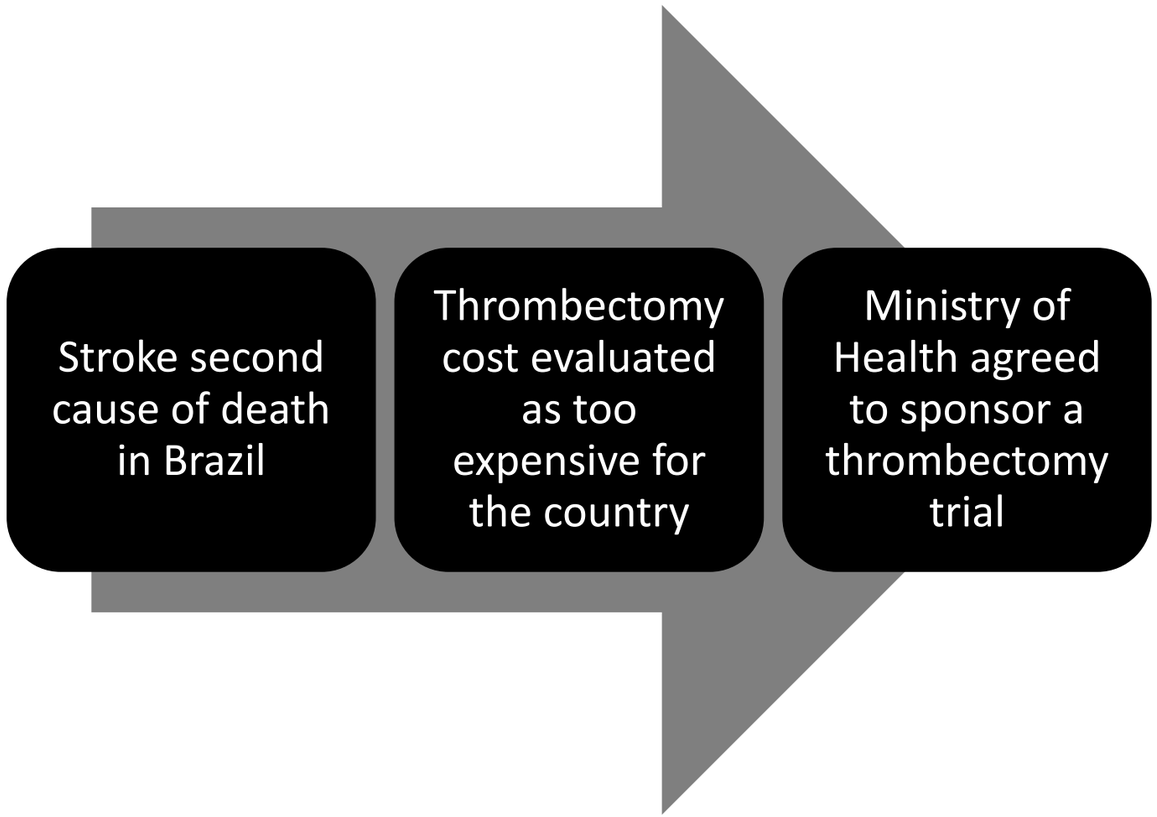
GUIDELINES

Brazilian guidelines for endovascular treatment of patients with acute ischemic stroke

Diretrizes brasileiras para o tratamento endovascular de pacientes com acidente vascular cerebral isquêmico agudo

Octávio Marques Pontes-Neto[*1], *Pedro Cougo*[*1], *Sheila Cristina Ouriques Martins*[2], *Daniel G. Abud*[1], *Raul G. Nogueira*[3], *Maramélia Miranda*[4], *Luiz Henrique de Castro-Afonso*[1], *Leticia C. Rebello*[5], *José Guilherme M. Pereira Caldas*[6], *Rodrigo Bazan*[7], *Daniel C Bezerra*[8], *Marco Tulio Rezende*[9], *Gabriel R. de Freitas*[10,11], *Alexandre Longo*[12], *Pedro Magalhães*[12], *João José Freitas de Carvalho*[13], *Francisco José Montalverne*[13], *Fabricio Oliveira Lima*[13], *Gustavo H. V. Andrade*[14], *Ayrton R. Massaro*[15], *Jamary Oliveira-Filho*[16], *Rubens Gagliardi*[17], *Gisele Sampaio Silva*[18,19]

Rationale for possible diffent outcomes of thrombectomy in low resource settings



Pre Hospital

- Delays in Diagnosis and Transfers
- Delays in Triage

Populational

- Vulnerable population

Hospital Infrastructure

- Post procedural treatment
- Lack of access to rehalbilitation

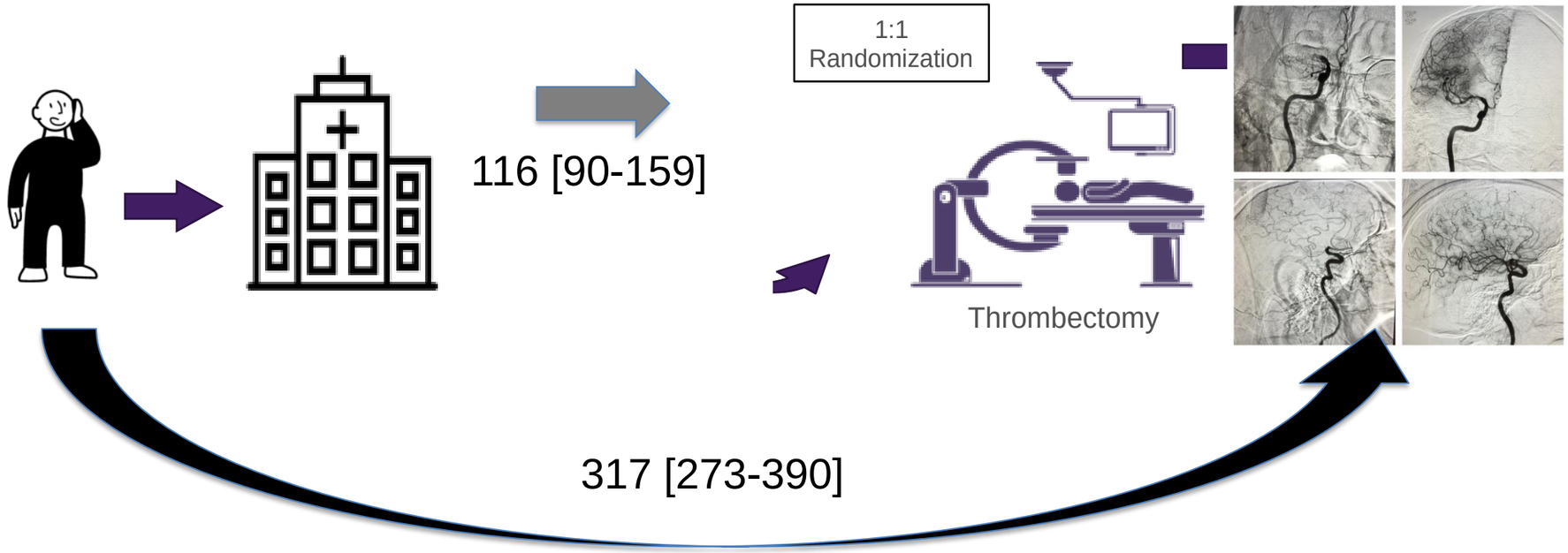
RESILIENT

Randomization of Endovascular Treatment with Stent-retriever and/or Thromboaspiration vs. Best Medical Therapy in Acute Ischemic Stroke due to Large VEssel OcclusioN Trial

for the RESILIENT Trial Investigators
Co Chairs: Raul Nogueira and Sheila Martins

Patient Presentation and Procedural Duration

	Thrombectomy	Clinical Arm
Symptoms onset-to-needle	170 [132-213]	161 [115-219]
Door-to-needle	34 [25-53]	33 [23-50]



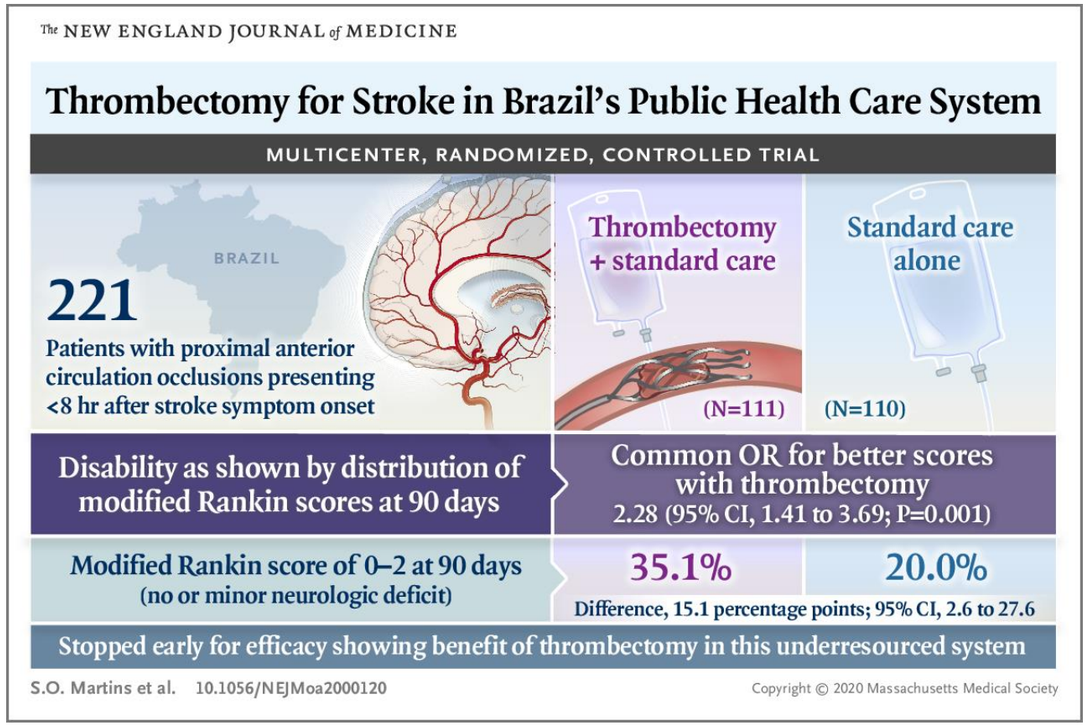
N Engl J Med 2020;382:2316-26.

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Thrombectomy for Stroke in the Public Health Care System of Brazil

S.O. Martins, F. Mont'Alverne, L.C. Rebello, D.G. Abud, G.S. Silva, F.O. Lima, B.S.M. Parente, G.S. Nakiri, M.B. Faria, M.E. Frudit, J.J.F. de Carvalho, E. Waihrich, J.A. Fiorot, Jr., F.B. Cardoso, R.C.T. Hidalgo, V.F. Zétola, F.M. Carvalho, A.C. de Souza, F.A. Dias, D. Bandeira, M. Miranda Alves, M.B. Wagner, L.A. Carbonera, J. Oliveira-Filho, D.C. Bezerra, D.S. Liebeskind, J. Broderick, C.A. Molina, J.E. Fogolin Passos, J.L. Saver, O.M. Pontes-Neto, and R.G. Nogueira, for the RESILIENT Investigators*



N Engl J Med 2020;382:2316-26.

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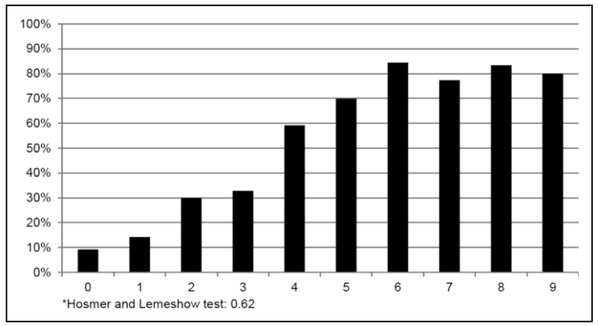
Field Assessment Stroke Triage for Emergency Destination

A Simple and Accurate Prehospital Scale to Detect Large Vessel Occlusion Strokes

Fabricio O. Lima, MD, MPH, PhD; Gisele S. Silva, MD, MPH, PhD; Karen L. Furie, MD, MPH; Michael R. Frankel, MD; Michael H. Lev, MD; Érica C.S. Camargo, MD, PhD, MSc; Diogo C. Haussen, MD; Aneesh B. Singhal, MD; Walter J. Koroshetz, MD; Wade S. Smith, MD; Raul G. Nogueira, MD

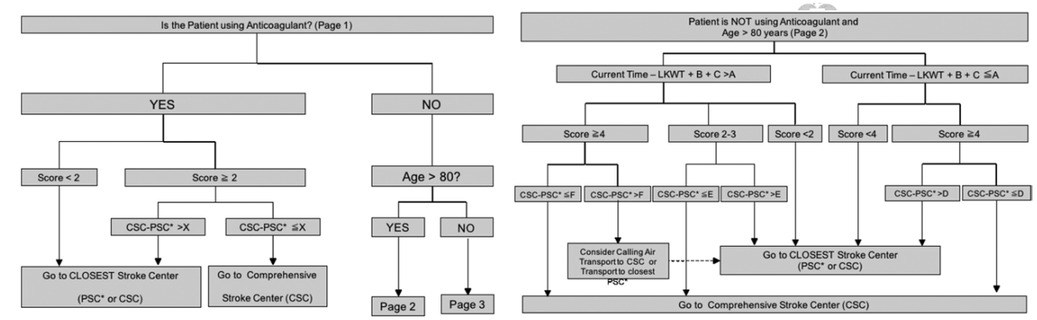
Item	FAST-ED Score	NIHSS Score Source
Facial palsy		
Normal or minor paralysis	0	0–1
Partial or complete paralysis	1	2–3
Arm weakness		
No drift	0	0
Drift or some effort against gravity	1	1–2
No effort against gravity or no movement	2	3–4
Speech changes		
Absent	0	0
Mild to moderate	1	1
Severe, global aphasia, or mute	2	2–3
Eye deviation		
Absent	0	0
Partial	1	1
Forced deviation	2	2
Denial/Neglect		
Absent	0	0
Extinction to bilateral simultaneous stimulation in only 1 sensory modality	1	1
Does not recognize own hand or orients only to one side of the body	2	2

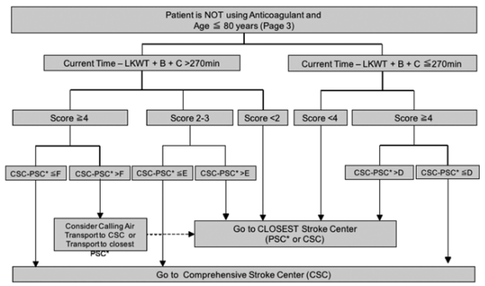


Original Contribution

The FAST-ED App: A Smartphone Platform for the Field Triage of Patients With Stroke

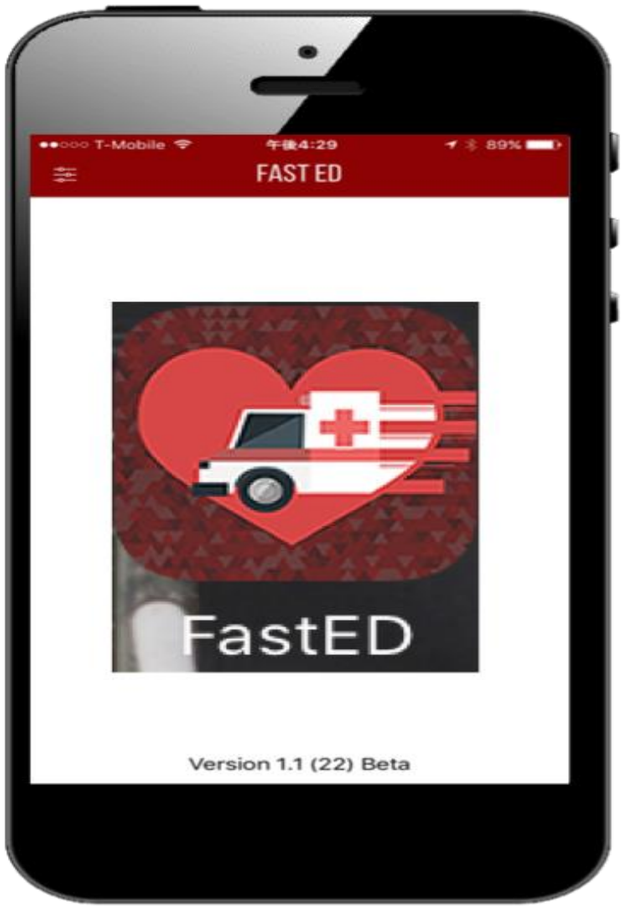
Raul G. Nogueira, MD*; Gisele S. Silva, MD, MPH, PhD*; Fabricio O. Lima, MD, MPH, PhD; Yu-Chih Yeh, PharmD; Carol Fleming, RN; Daniel Branco, MD, PhD; Arthur H. Yancey, MD, MPH; Jonathan J. Ratcliff, MD, MPH; Robert Keith Wages, BS; Earnest Doss; Mehdi Bouslama, MD; Jonathan A. Grossberg, MD; Diogo C. Haussen, MD; Teppei Sakano, BCS; Michael R. Frankel, MD





Stroke 47.8 (2016): 1997-2002
Stroke(2017): STROKEAHA-116

Regulation of Patients using the FAST ED App



Pontuação = 0

Probabilidade de oclusão de grandes vasos: <15%

A avaliação indica que o paciente deve ser levado ao centro de AVC mais próximo.

Liste os centros mais próximos

Pontuação = 6

Probabilidade de oclusão de grandes vasos: ~60%-80%

A Avaliacao Indica que O Paciente Deve Ser Levado ao Hospital De alta Complexidade em AVC (eu Colocaria Centro De Excelencia em AVC) mais próximo

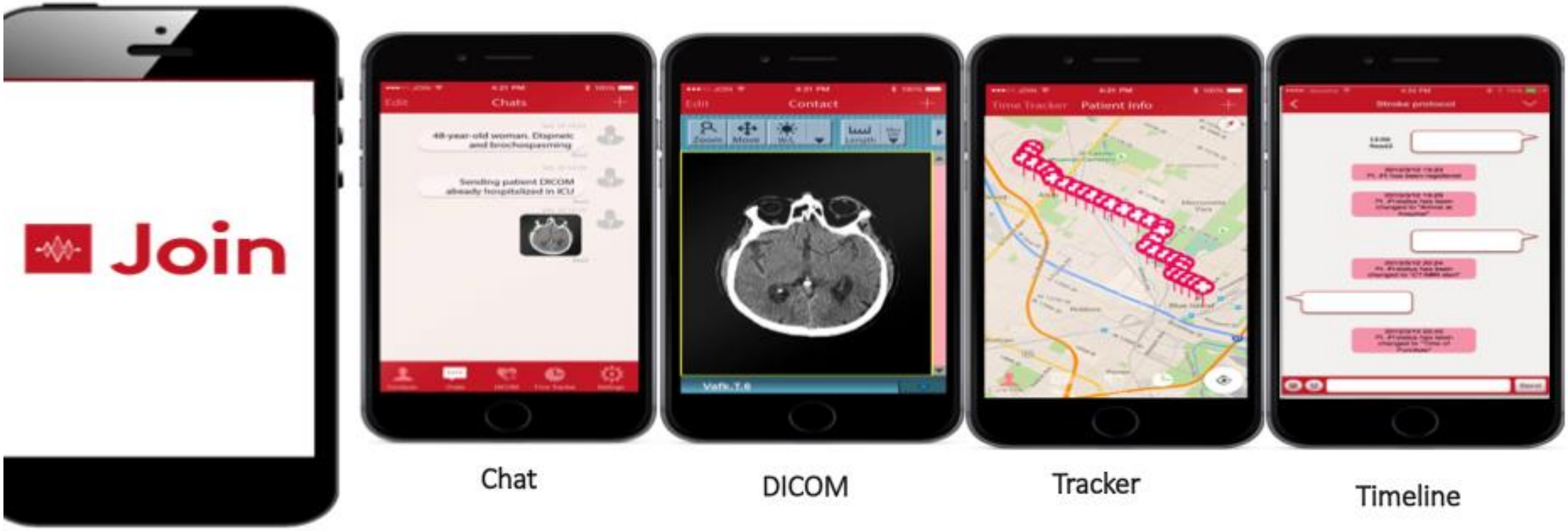
Crítico

Liste os centros mais próximos

American Stroke Association.
A division of the American Heart Association.

SVIN Society of Vascular and Interventional Neurology

Simple Solutions: connecting stroke teams

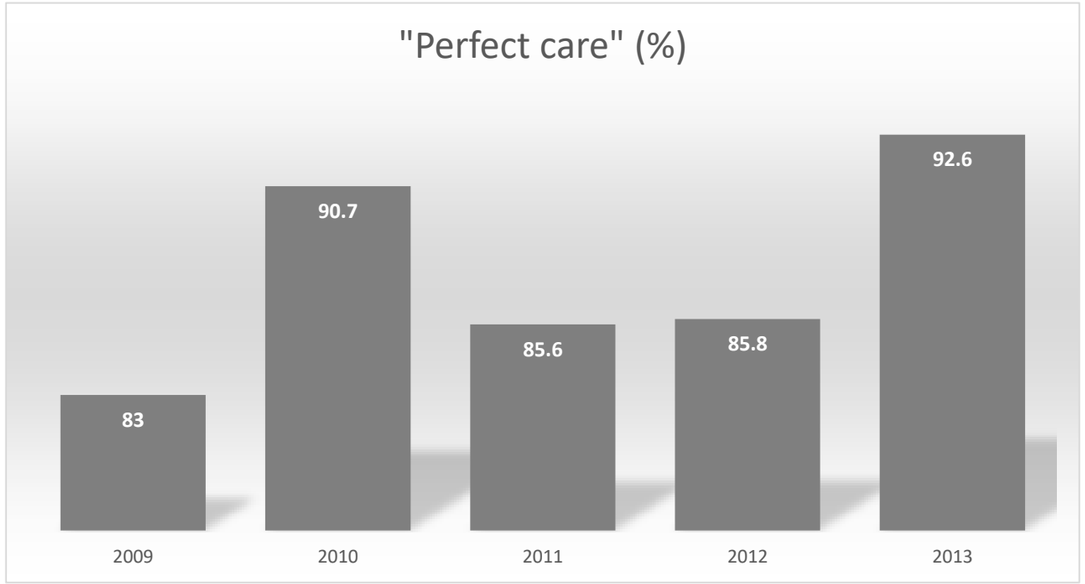


Patterns of Care and Temporal Trends in Ischemic Stroke Management: A Brazilian Perspective

Monique Bueno Alves, RN, MsC,*,† Gisele Sampaio Silva, MD, MPH, PhD,*,† Renata Carolina Acri Miranda, RN,† Rodrigo Meireles Massaud, MD,† Andreia Maria Heins Vaccari, RN,† Miguel Cendoroglo-Neto, MD, PhD,*,† and Solange Diccini, RN, PhD*

Table 3. *Adherence to Performance Measures according to the year of discharge*

Patterns of care	2009	2010	2011	2012	2013	All	*P*
IV rtPA (≤3 h) (%)	85.7	100.0	77.8	100.0	91.7	91.3	.397
Early antithrombotics (%)	98.7	100.0	99.1	99.1	100.0	99.4	.673
DVT prophylaxis (%)	100.0	100.0	100.0	100.0	100.0	100.0	ns
Antithrombotics at discharge (%)	90.0	100.0	100.0	95.5	99.1	97.4	<.001
Anticoagulation for AF (%)	66.7	84.6	80.0	73.7	62.5	72.6	.678
Cholesterol reduction* (%)	69.2	78.7	69.0	70.4	88.0	75.6	.003
Smoking cessation (%)	71.4	100.0	70.0	92.3	100.0	84.0	.021
Door-to-CT time (≤45 min) (%)	89.7	70.7	67.3	67.5	66.7	71.1	.210
Mean door-to-CT (min)	33.3 ± 22.9	45.8 ± 37.8	47.8 ± 41.2	41.6 ± 38.2	45.2 ± 23.4	43.6 ± 34.7	.450
Door-to-needle time (≤60 min)	33.3	75.0	61.5	50.0	66.7	58.5	.226
Mean door-to-needle time (min)	82.5 ± 28.4	49.0 ± 20.0	59.3 ± 26.1	64.6 ± 28.59	65.3 ± 30.8	62.6 ± 27.8	.118
Stroke education* (%)	73.1	85.1	78.0	74.8	90.6	80.8	.006
Perfect care (%)	83.0 ± 18.9	90.7 ± 11.7	85.6 ± 17.4	85.8 ± 17.7	92.6 ± 11.4	87.8 ± 15.8	<.001



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MR CLEAN (2014)

EXTEND-IA (2015)

SWIFT PRIME (2015)

defuse·3

REVASCAT

ESCAPE (2015)

HRACE

DAWN TRIAL

Low- and middle-income countries: 80% of the world population

Resilient

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SOCIETY OF VASCULAR AND INTERVENTIONAL NEUROLOGY

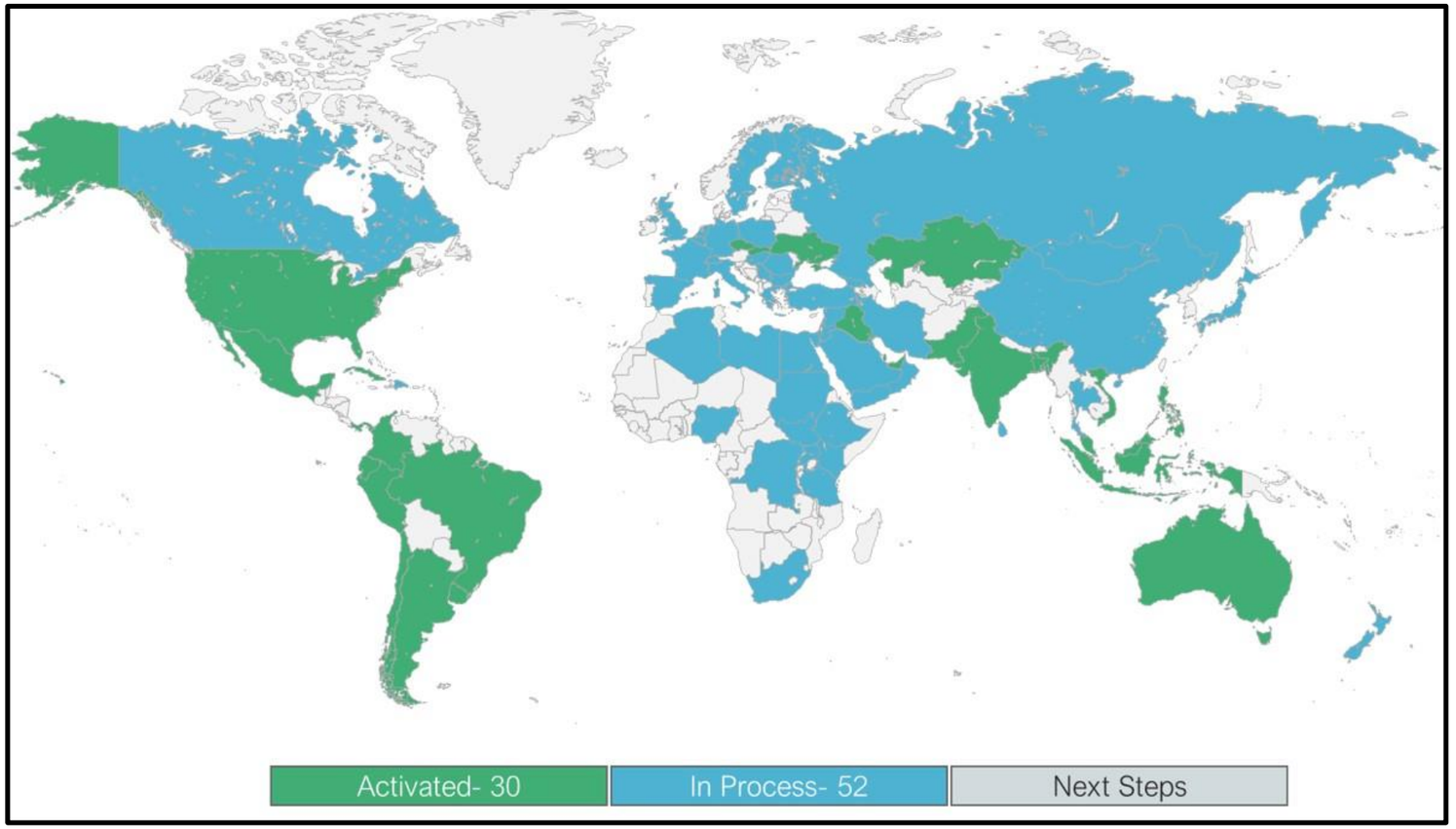
Panel Discussion

Audience Q & A

To Ask a Question

SOCIETY OF VASCULAR AND INTERVENTIONAL NEUROLOGY

MT2020+
Mission Thrombectomy



- Expanded Global Executive Committee to over 210 members
- Activated and continue to activate regional committees across the globe across 6 continents
- Researching and developing a mechanical thrombectomy access score
- Global Thrombectomy Tracking (GTT) App

Email: mt2020@svin.org
Website: https://missionthrombectomy2020.org/
MT2020 App: https://mt2020.org/

Upcoming Opportunities

- On-demand viewing

- World Stroke Day (October 29)
  - One CycleNation with ASA
  - Discounted educational opportunities with SVIN

- AHA Scientific Sessions (November 13 – 17)

- SVIN Annual Conference (November 18 – 21)

- 2021: Stroke: Vascular and Interventional Neurology journal

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Thank You.

The opinions expressed during this webinar are those of the speakers and do not necessarily reflect the opinions, recommendations or guidance of American Stroke Association or Society of Vascular and Interventional Neurology.