Hematoma Intraparenquimatoso

Atualizações
e questões práticas

João Brainer Clares de Andrade
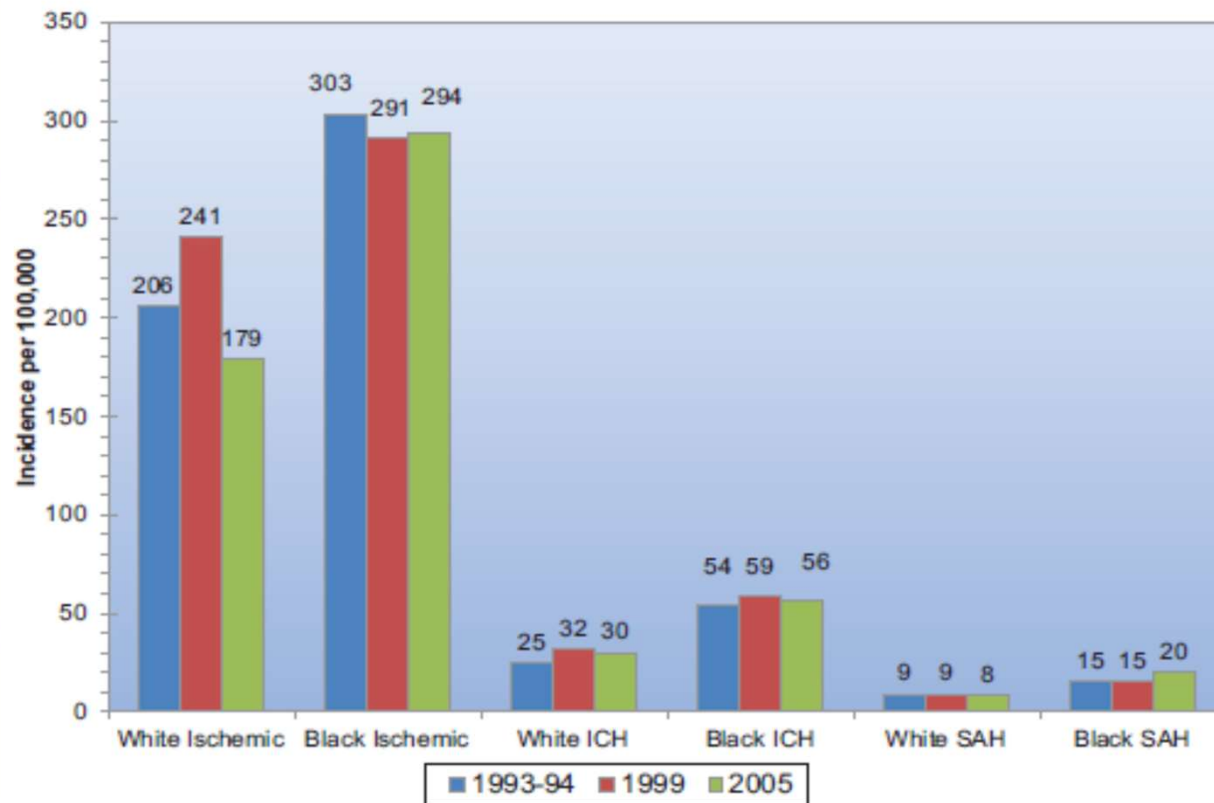
Professor Afiliado - Universidade Federal de São Paulo

Professor Titular – Centro Universitário São Camilo

Hemorragia intraparenquimatosa

Afet... om

Respons... á, cerca

The cas... 1 year

Falta de controle pressórico é principal causa. (Anesch, 1965)

Quais os fatores de risco?

Os fatores de risco comuns para a ICH espontânea incluem HAS, idade, história de uso de álcool pesado, uso de metanfetamina ou cocaína, baixa escolaridade e alelos associados à proteína amilóide cerebral
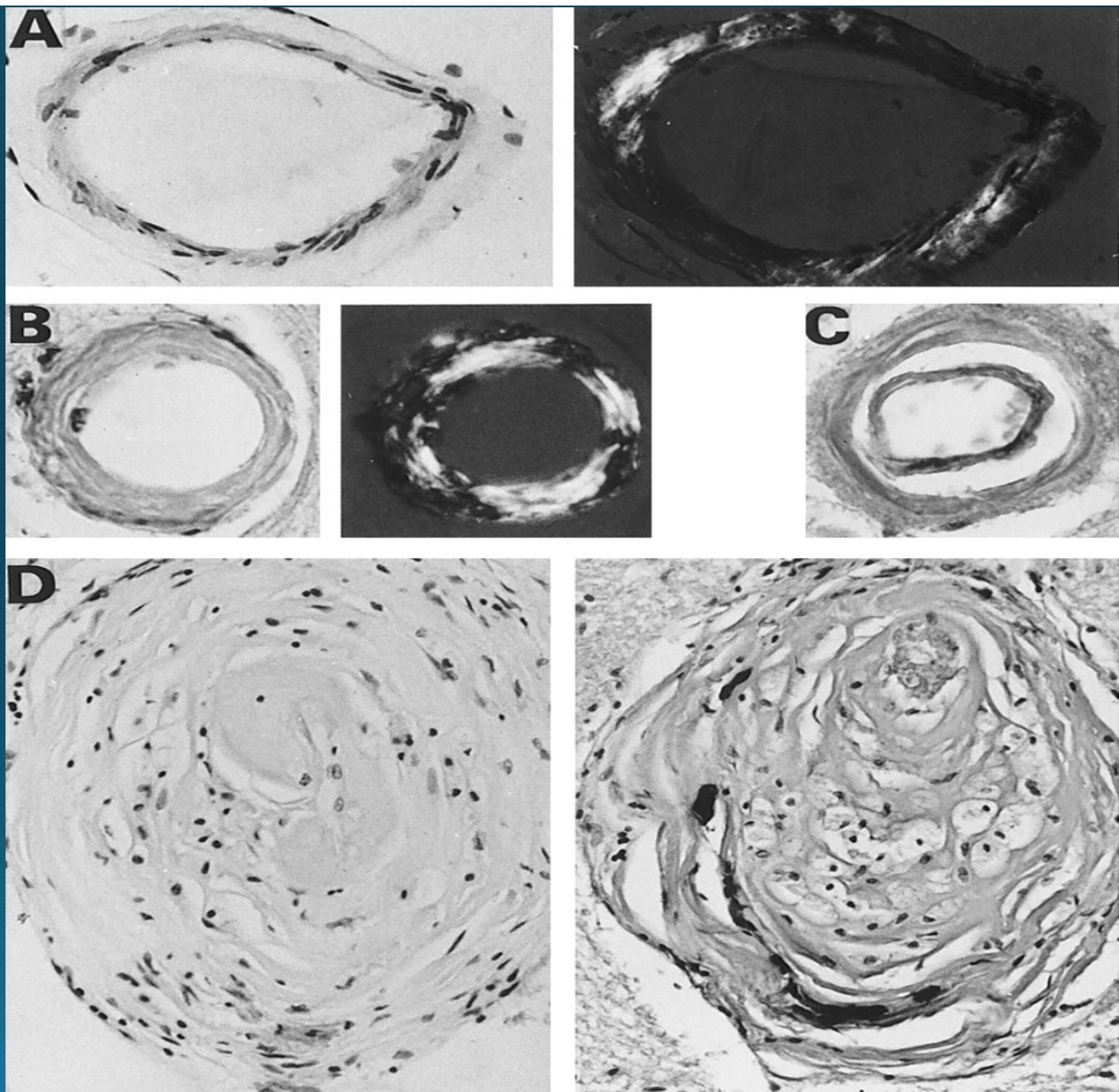
Ariesen, 2003

Etiologias

HAS está presente em 50–70 % dos pacientes com AVCh

PAS ≥160 mmHg ou PAD ≥110 mmHg tem 5.5 (95 % CI 3.0–10.0) vezes a chance de AVCh

Uso de Warfarina já conta como 15% dos casos de AVCh

Manoel, 2016
Sturgeon, 2007
Greenberg, 1997

SMASH-U

A Proposal for Etiologic Classification of Intracerebral Hemorrhage

Atte Meretoja, MD, PhD, MSc(Stroke Med); Daniel Strbian, MD, PhD; Jukka Putaala, MD, PhD; Sami Curtze, MD, PhD; Elena Haapaniemi, MD, PhD; Satu Mustanoja, MD, PhD, MSc(Stroke Med); Tiina Sairanen, MD, PhD, MSc(Stroke Med); Jarno Satopää, MD; Heli Silvennoinen, MD, PhD; Mika Niemelä, MD, PhD; Markku Kaste, MD, PhD; Turgut Tatlisumak, MD, PhD

SMASH-U
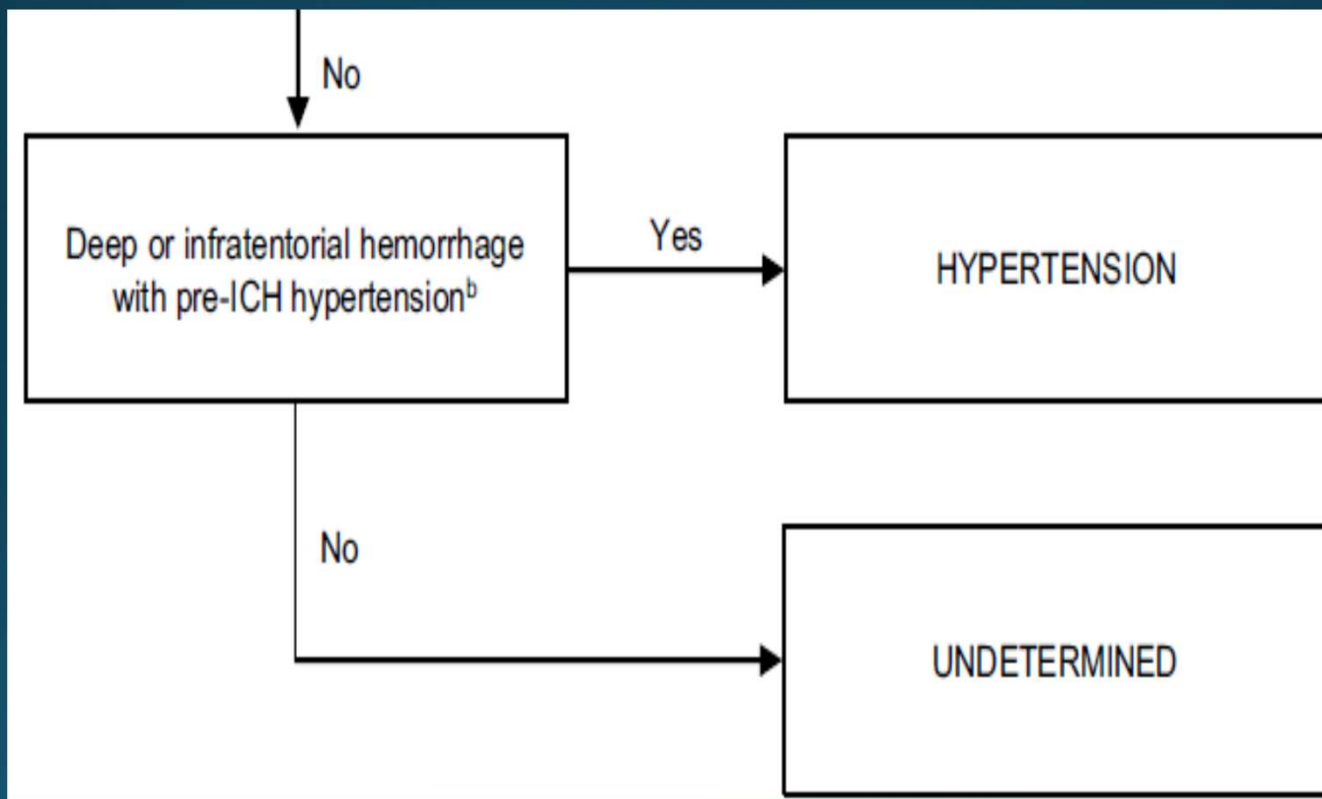
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SMASH-U

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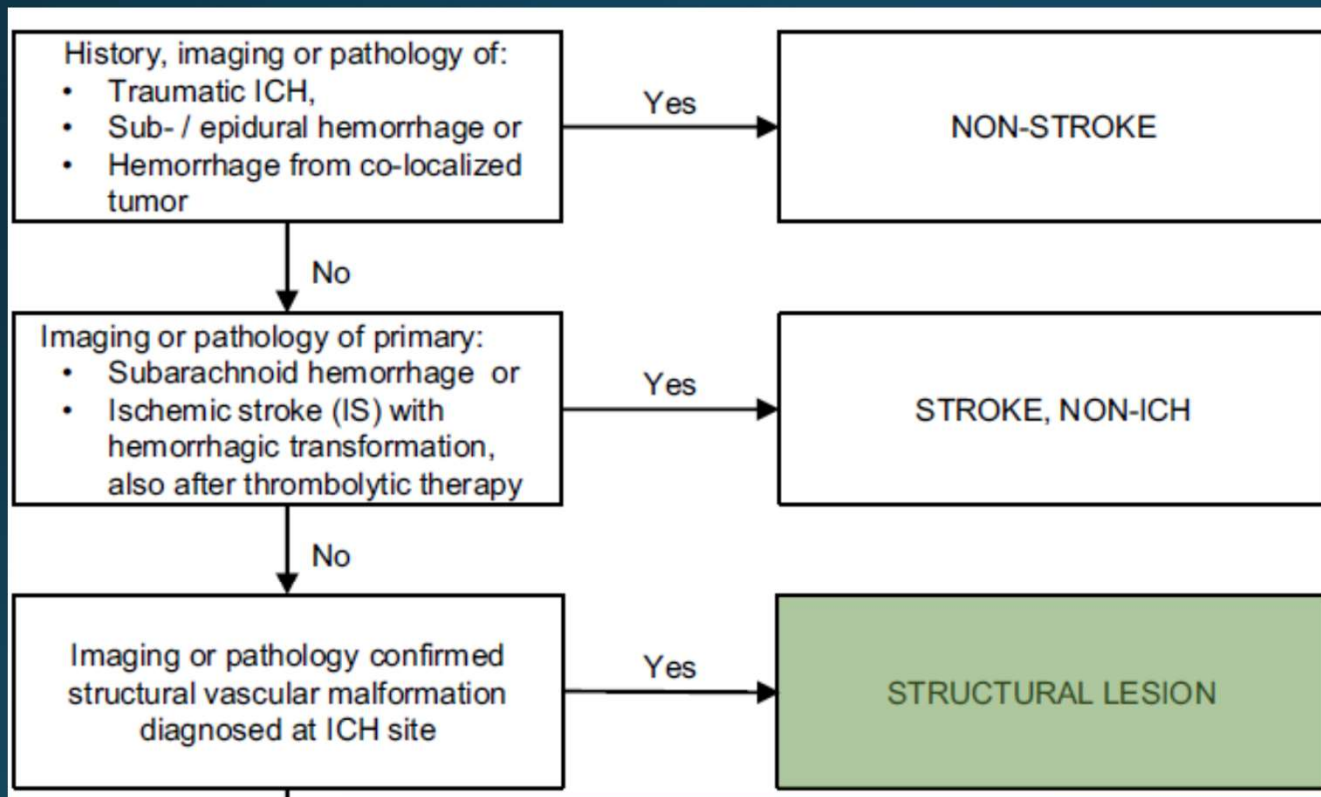
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History, imaging or pathology of:
- Traumatic ICH,
- Sub- / epidural hemorrhage or
- Hemorrhage from co-localized tumor

Yes → NON-STROKE

No ↓

Imaging or pathology of primary:
- Subarachnoid hemorrhage or
- Ischemic stroke (IS) with hemorrhagic transformation, also after thrombolytic therapy

Yes → STROKE, NON-ICH

No ↓

Imaging or pathology confirmed structural vascular malformation diagnosed at ICH site

Yes → STRUCTURAL LESION

Cavernomas (n31) or arteriovenous malformations (n19)

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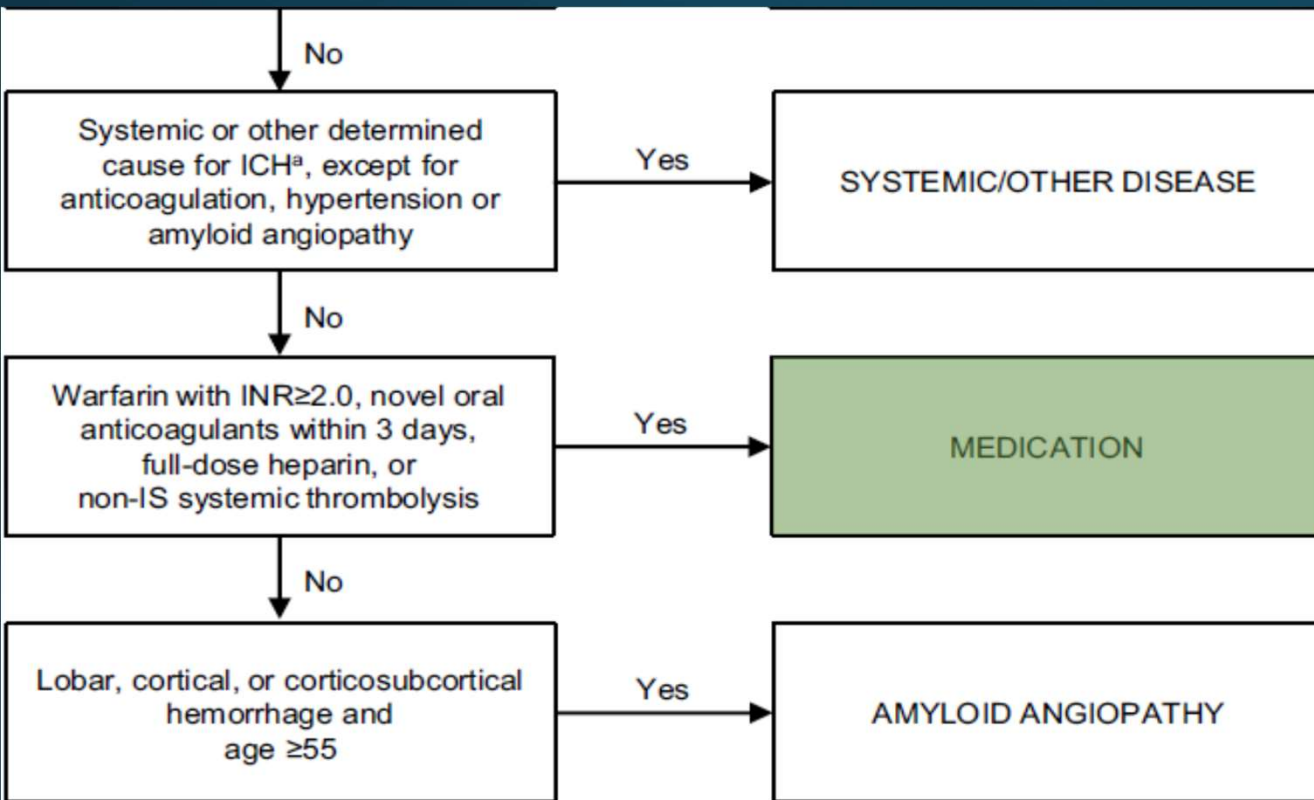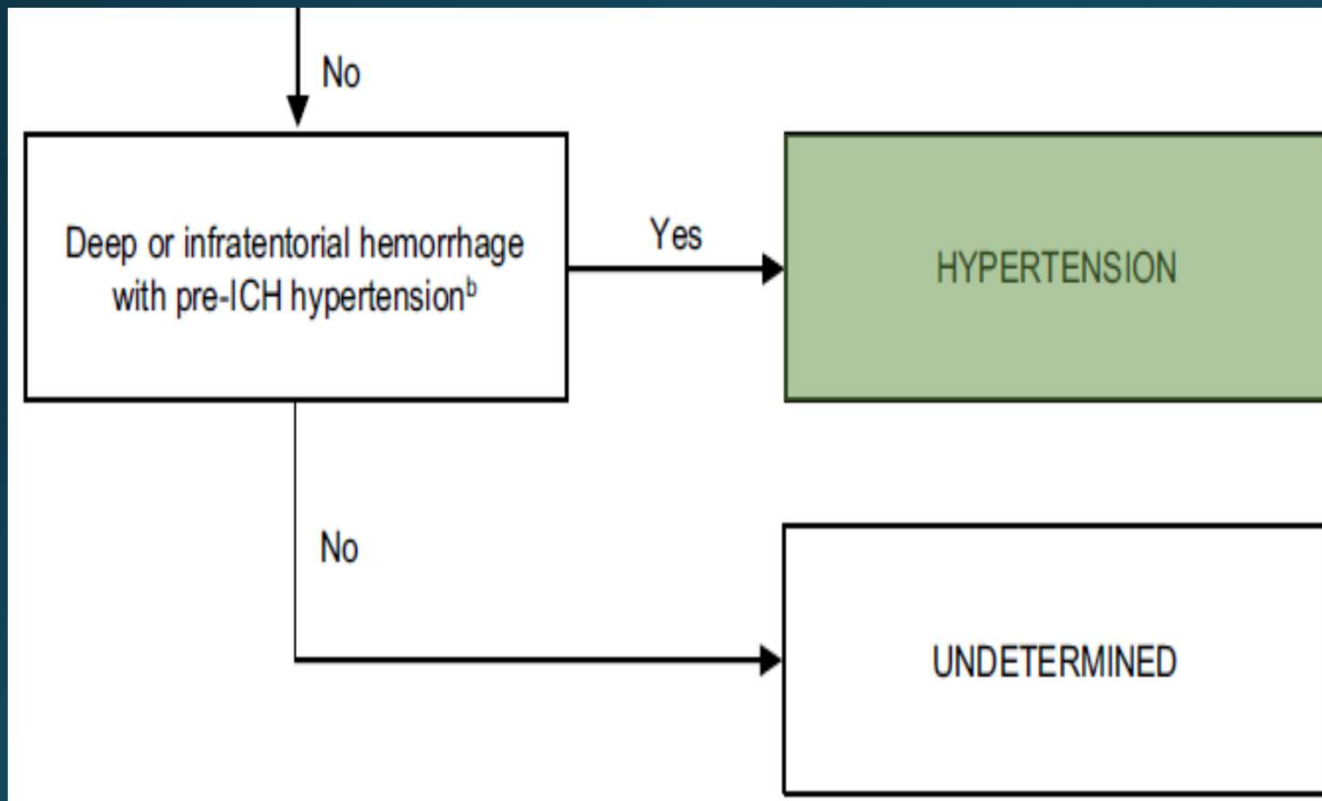
No

Systemic or other determined cause for ICH[a], except for anticoagulation, hypertension or amyloid angiopathy → Yes → SYSTEMIC/OTHER DISEASE

No

Warfarin with INR≥2.0, novel oral anticoagulants within 3 days, full-dose heparin, or non-IS systemic thrombolysis → Yes → MEDICATION

No

Lobar, cortical, or corticosubcortical hemorrhage and age ≥55 → Yes → AMYLOID ANGIOPATHY

64 had warfarin within the therapeutic international normalized ratio (INR) range of 2.0 to 3.0 and a high 3-month mortality rate (52%)

SMASH-U

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No

Deep or infratentorial hemorrhage with pre-ICH hypertension[b]

Yes → HYPERTENSION

No → UNDETERMINED

Amyloid angiopathy (n205 [20%]) and hypertension (n354 [35%]) were common classifications

Table 1. Baseline Characteristics and Selected Clinical, Laboratory, and Imaging Parameters, Procedures, and Outcome by SMASH-U Etiology

|	All Patients (n=1013)	Structural Lesion (n=50)	Medication (n=143)	Amyloid Angiopathy (n=205)	Systemic Disease (n=48)	Hypertensive Angiopathy (n=354)	Undetermined (n=213)	P Value
Age, y	68 (58–78)	55 (38–64)	76 (68–82)	73 (66–80)	60 (51–68)	66 (57–78)	62 (54–73)	<0.001
Male sex	582 (57%)	22 (44%)	88 (62%)	100 (49%)	32 (67%)	204 (58%)	136 (64%)	0.006
Hypertension	637 (63%)	14 (28%)	111 (78%)	117 (57%)	24 (50%)	354 (100%)	17 (8%)	<0.001
Diabetes	143 (14%)	4 (8%)	31 (22%)	26 (13%)	7 (15%)	64 (18%)	10 (5%)	<0.001
Coronary heart disease	128 (13%)	4 (8%)	41 (29%)	35 (17%)	3 (7%)	43 (12%)	2 (1%)	<0.001
Peripheral artery disease	19 (2%)	0	6 (4%)	5 (2%)	0	6 (2%)	2 (1%)	0.20
Atrial fibrillation	142 (14%)	1 (2%)	98 (70%)	10 (5%)	5 (11%)	26 (7%)	2 (1%)	<0.001
Previous stroke	146 (15%)	7 (14%)	29 (20%)	34 (17%)	5 (11%)	55 (16%)	16 (8%)	0.02
Previous ICH	54 (5%)	5 (10%)	5 (4%)	20 (10%)	2 (4%)	19 (5%)	3 (1%)	0.004
Antiplatelet	265 (26%)	8 (16%)	24 (17%)	64 (31%)	9 (19%)	131 (37%)	29 (14%)	<0.001
Oral anticoagulation	132 (13%)	2 (4%)	122 (85%)	2 (1%)	1 (2%)	5 (1%)	0	<0.001
Antihypertensive	489 (48%)	12 (24%)	103 (72%)	94 (46%)	23 (48%)	247 (70%)	9 (4%)	<0.001
Statin	191 (19%)	12 (24%)	39 (27%)	42 (21%)	4 (9%)	84 (24%)	10 (5%)	<0.001
NIHSS	11 (4–20)	3 (1–7)	14 (6–25)	6 (3–14)	11 (3–20)	13 (5–21)	12 (5–19)	<0.001
GCS	14 (10–15)	15 (15–15)	14 (7–15)	15 (12–15)	14 (10–15)	14 (10–15)	14 (11–15)	0.002
INR	1.0 (1.0–1.2)	1.0 (0.9–1.0)	3.0 (2.5–3.8)	1.0 (0.9–1.1)	1.3 (1.1–1.5)	1.0 (0.9–1.1)	1.0 (0.9–1.0)	<0.001
Thrombocytes, E9/L	209 (171–253)	231 (190–265)	197 (154–235)	208 (172–253)	123 (52–212)	214 (174–257)	215 (182–260)	<0.001
ICH volume, mL	9.8 (3.8–28)	2.8 (0.8–5.7)	14 (4.8–46)	14 (4.5–34.4)	9.8 (3.0–32)	9.3 (3.6–22)	9.1 (4.4–24.6)	<0.001
Any repeat imaging	631 (62%)	47 (94%)	83 (58%)	131 (64%)	31 (65%)	201 (57%)	138 (65%)	<0.001
MRI performed at any time	153 (15%)	29 (58%)	7 (5%)	42 (20%)	12 (25%)	24 (7%)	38 (18%)	<0.001
Cortical/subcortical/lobar*	394 (39%)	27 (54%)	62 (43%)	205 (100%)	29 (60%)	17 (5%)	54 (25%)	<0.001
Deep supratentorial*	544 (54%)	11 (22%)	72 (50%)	11 (5%)	15 (31%)	293 (83%)	142 (67%)	<0.001
Intraventricular*	416 (41%)	9 (18%)	67 (47%)	39 (19%)	17 (35%)	182 (52%)	102 (48%)	<0.001
Infratentorial*	142 (14%)	15 (30%)	18 (13%)	1 (0%)	9 (19%)	70 (20%)	29 (14%)	<0.001
In-hospital mortality	244 (24%)	1 (2%)	64 (45%)	27 (13%)	18 (38%)	83 (23%)	41 (19%)	<0.001
Lost to 3-mo follow-up	29 (3%)	0	1 (1%)	7 (3%)	0	15 (4%)	6 (3%)	0.16
Mortality at 3 mo	317 (32%)	2 (4%)	77 (54%)	43 (22%)	21 (44%)	111 (33%)	63 (30%)	<0.001

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Table 2. Predictors of 3-Mo Mortality in Multivariable Analysis

Predictors	OR (95% CI)	P Value	Wald
Age, y per decade	1.63 (1.37–1.95)	<0.001	29.7
Male sex	1.74 (1.17–2.61)	0.007	7.3
NIHSS on arrival per point	1.12 (1.08–1.16)	<0.001	46.7
GCS on arrival per point	0.96 (0.89–1.04)	0.29	1.1
ICH volume per 10 mL	1.28 (1.17–1.41)	<0.001	27.7
Intraventricular hemorrhage	2.12 (1.42–3.17)	<0.001	13.4
Infratentorial hemorrhage	2.16 (1.19–3.91)	0.01	6.5
SMASH-U		<0.001	32.4
Structural lesion*	0.06 (0.01–0.37)	0.002	9.2
Medical anticoagulation*	1.92 (1.03–3.60)	0.04	4.2
Amyloid angiopathy*	0.61 (0.32–1.18)	0.14	2.2
Systemic cause*	3.97 (1.57–10.05)	0.004	8.5
Hypertension*	0.82 (0.49–1.37)	0.45	0.6

Localização
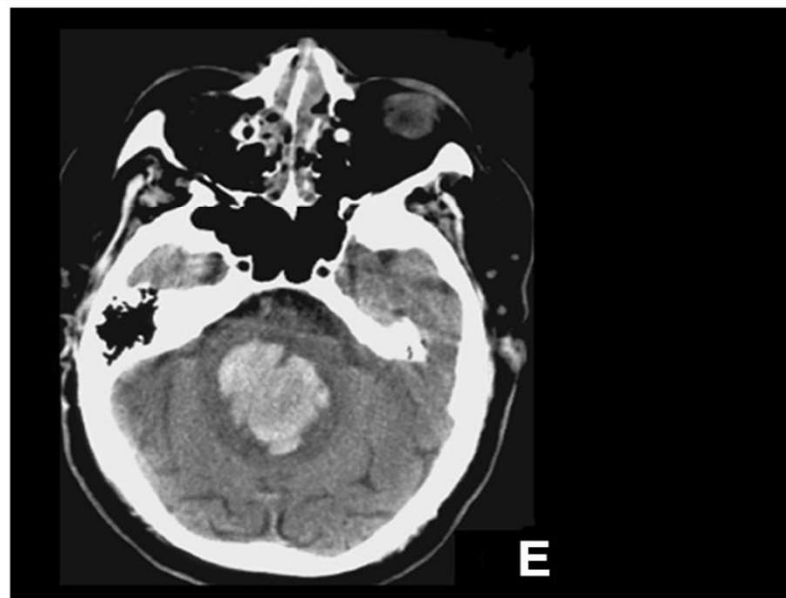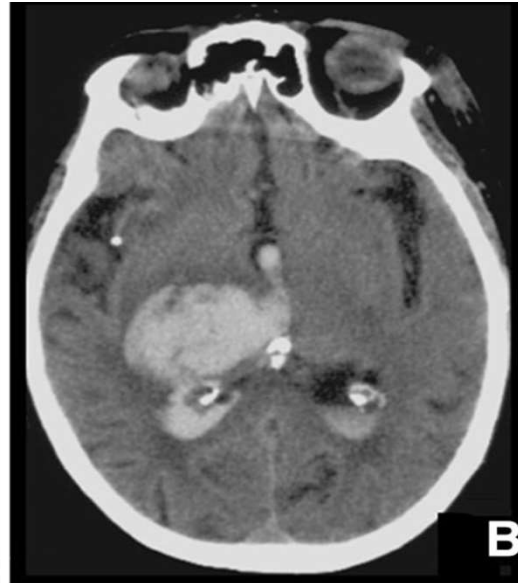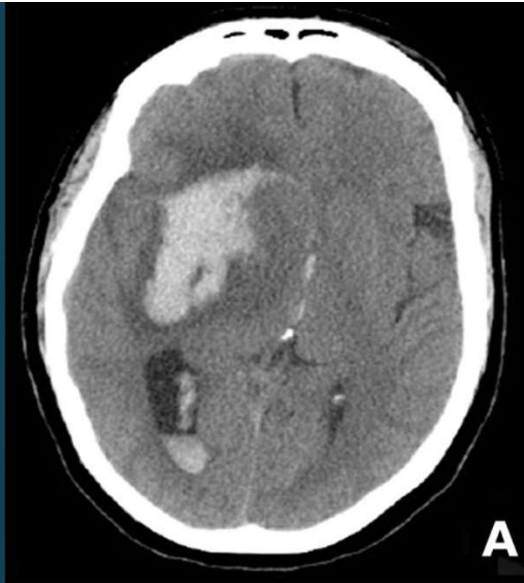
Intracerebral hemorrhage location and outcome among INTERACT2 participants

OPEN

Intracerebral hemorrhage location and outcome among INTERACT2 participants

OPEN

- Coleta multicêntrica de 2008-2012
- Foram 2839 pacien
- Nas localizações a   a com mais de 1/3 do hematoma
  - Outcomes
    - Morte
    - Grave perda func
    - European Quality
      - Mobility, self-c   xiety/depression

Caudate head

Thalamus

Putamen/globus pallidus

External capsule

Anterior limb of internal capsule

Posterior limb of internal capsule

Lobar

Infratentorial

Intracerebral hemorrhage location and outcome among INTERACT2 participants

OPEN

	No.	Death or major disability		Major disability		Death	
		OR	95% CI	OR	95% CI	OR	95% CI
Caudate head	42	0.42	0.16-1.14	0.24	0.09-0.62[a]	2.19	0.77-6.26
Thalamus	640	2.24	1.40-3.57[b]	1.18	0.82-1.71	1.97	1.18-3.29[a]
Putamen/globus pallidus	1,161	1.36	0.87-2.14	0.86	0.60-1.22	1.11	0.68-1.82
External capsule	553	1.05	0.78-1.40	0.96	0.74-1.25	1.23	0.81-1.87
Anterior limb of internal capsule	102	1.03	0.56-1.91	1.00	0.59-1.71	0.94	0.45-1.97
Posterior limb of internal capsule	957	2.10	1.65-2.68[b]	1.81	1.45-2.26[b]	1.04	0.72-1.51
Lobar	297	1.34	0.86-2.08	0.61	0.43-0.88[a]	1.95	1.21-3.15[a]
Infratentorial	141	3.04	1.68-5.50[b]	1.27	0.77-2.11	2.45	1.09-5.50[c]

Abbreviations: CI = confidence interval; ICH = intracerebral hemorrhage; No. = number of cases by ICH location; OR = odds ratio.

Intracerebral hemorrhage location and outcome among INTERACT2 participants

Conclusion: Poor clinical outcomes are related to ICH affecting the posterior limb of internal capsule, thalamus, and infratentorial sites. The highest association with death or major disability and poor EQ-5D utility score was seen in ICH encompassing the thalamus and posterior limb of internal capsule.

Iniciando o manejo

Checklist for the 1st hour

☐ Check CBC, PT/INR, PTT

☐ Head Imaging Results: Hematoma volume and location

☐ GCS score

☐ Calculate ICH Score

Interventions

☐ Coagulopathy reversal

☐ Blood pressure lowering

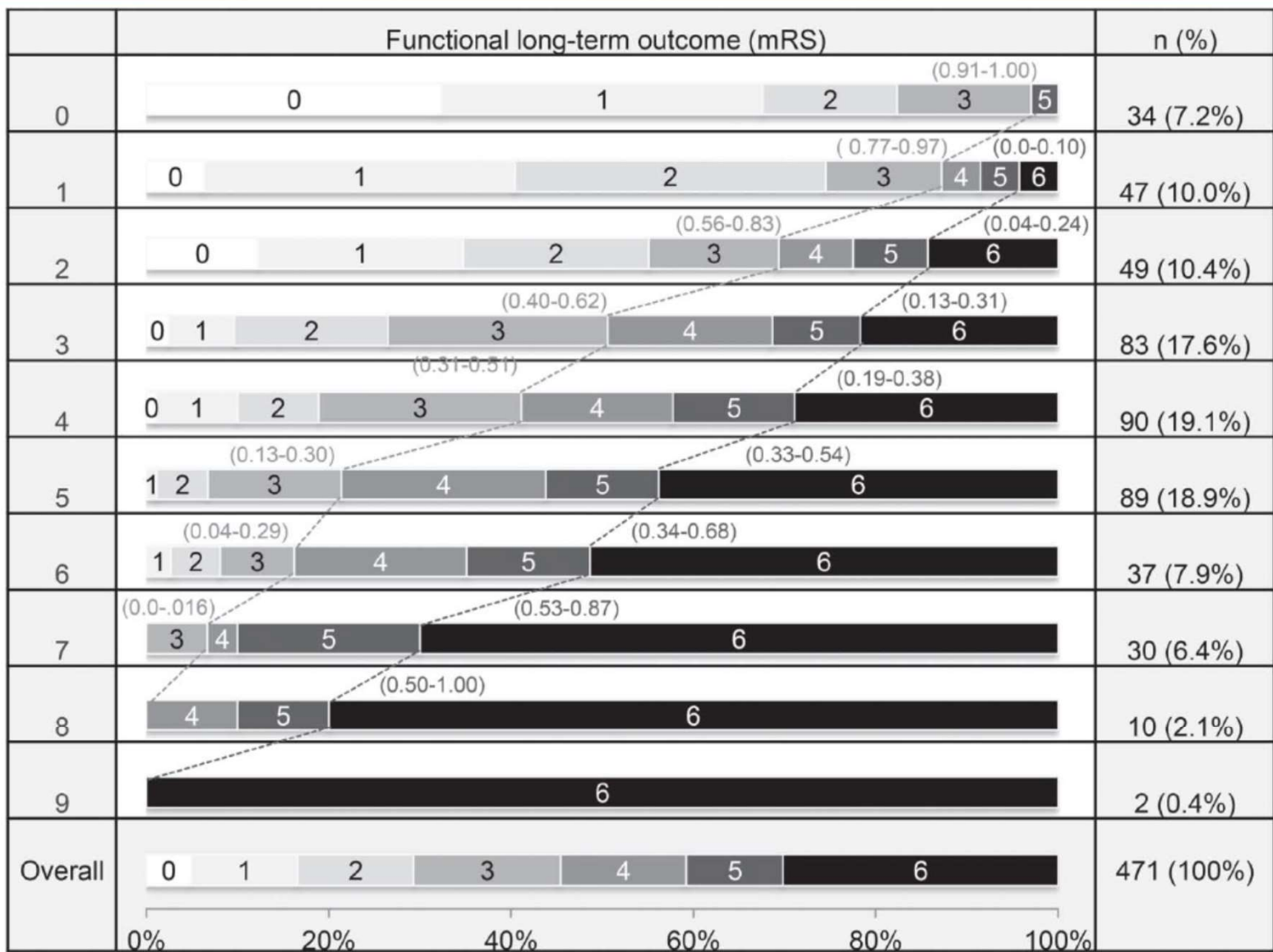☐ Surgical hematoma evacuation (if indicated)
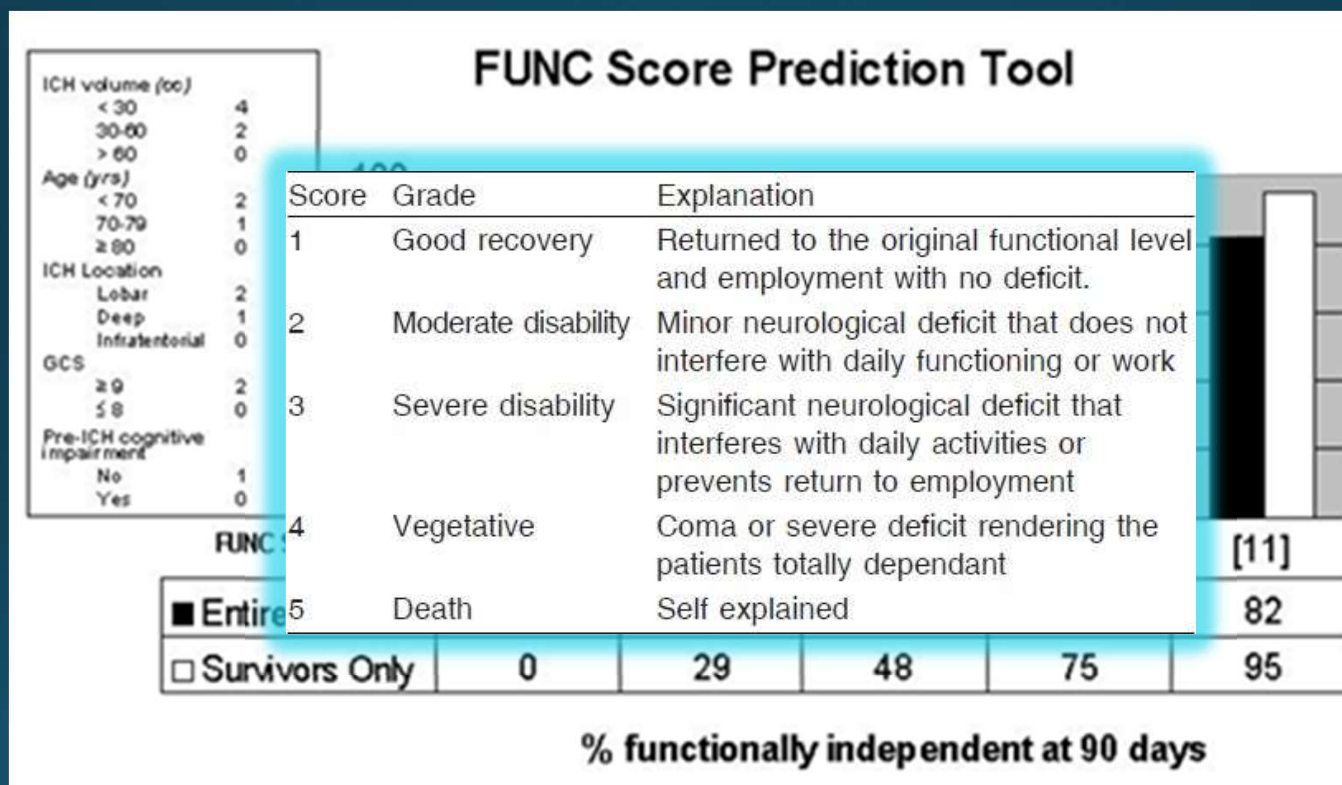
☐ Airway/ventilation management

ENLS
EMERGENCY NEUROLOGICAL LIFE SUPPORT

ENLS

ICH

Component	ICH Score Points
GCS Score	2
	1
	0
ICH Volume	1
	0
Intraventricular Hemorrhage	1
	0
Infratentorial	1
	0
Age (years)	1
	0
Total ICH Score	**0 - 6**

Figure 1. The ICH Score and 30-day mortality. Data were revised from Hemphill JC 3rd, Bonovich DC, Besmertis L, Manley GT, Johnston SC. The ICH score: a simple, reliable grading scale for intracerebral hemorrhage. *Stroke* 2001;32:891–897. There was no patient with a score of 6 in the cohort, but an ICH score of 6 would be predicted to be associated with a high risk of mortality.

ENLS
EMERGENCY NEUROLOGICAL LIFE SUPPORT

Functional long-term outcome (mRS)

FUNC Score

Rost, 2008

Neuroimagem

Em quanto tempo devo repetir a imagem?

Qual o melhor método de imagem?

2. Rapid neuroimaging with CT or MRI is recommended to distinguish ischemic stroke from ICH (*Class I; Level of Evidence A*). (Unchanged from the previous guideline)

3. CTA and contrast-enhanced CT may be considered to help identify patients at risk for hematoma expansion (*Class IIb; Level of Evidence B*), and CTA, CT venography, contrast-enhanced CT, contrast-enhanced MRI, magnetic resonance angiography and magnetic resonance venography, and catheter angiography can be useful to evaluate for underlying structural lesions including vascular malformations and tumors when there is clinical or radiological suspicion (*Class IIa; Level of Evidence B*). (Unchanged from the previous guideline)

Neuroimagem

Rara expansão após 24-48h

*Talvez seja esse tempo o ideal
para repetir a imagem*

Boulouis et al., 2017
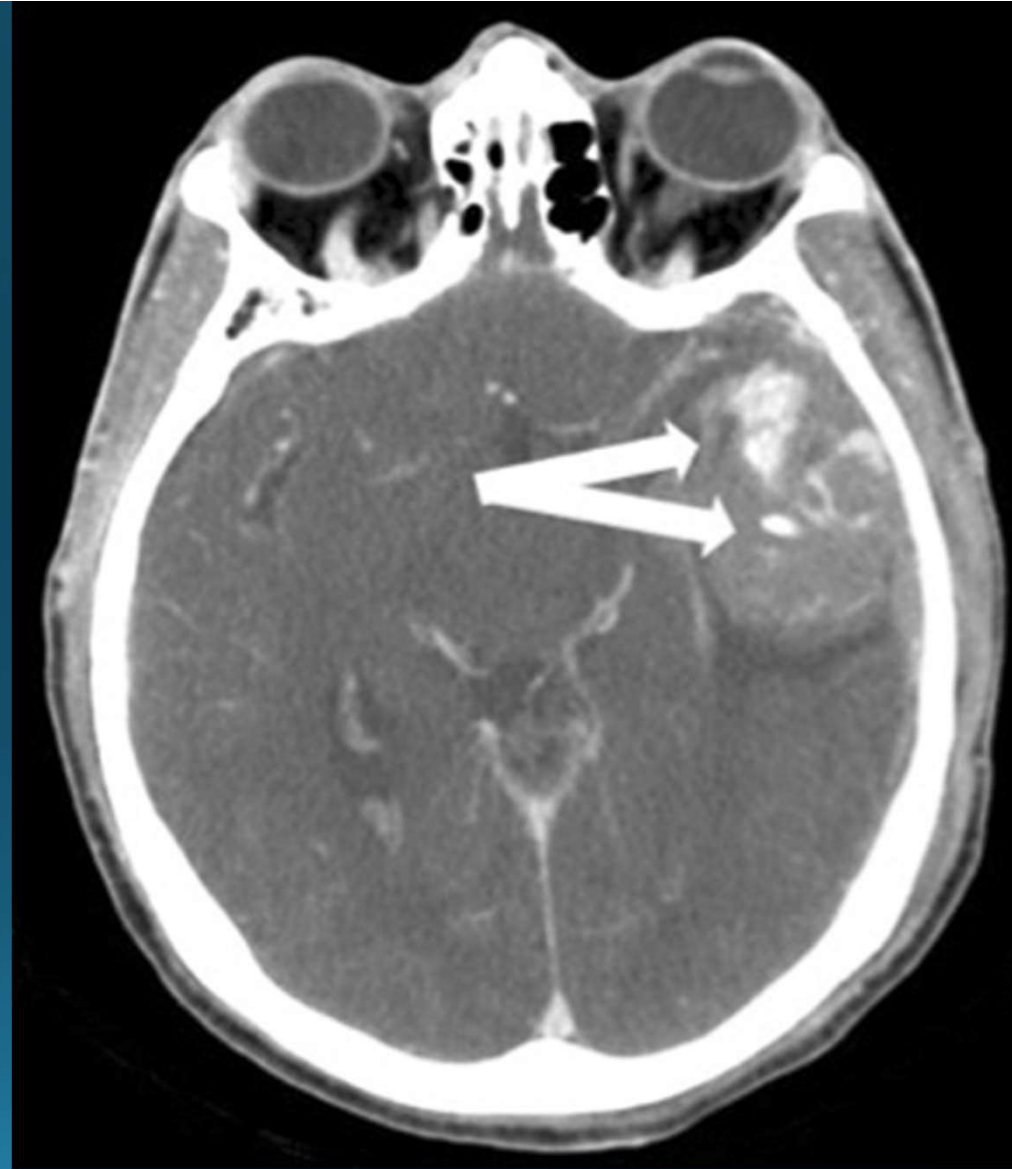
Neuroimagem
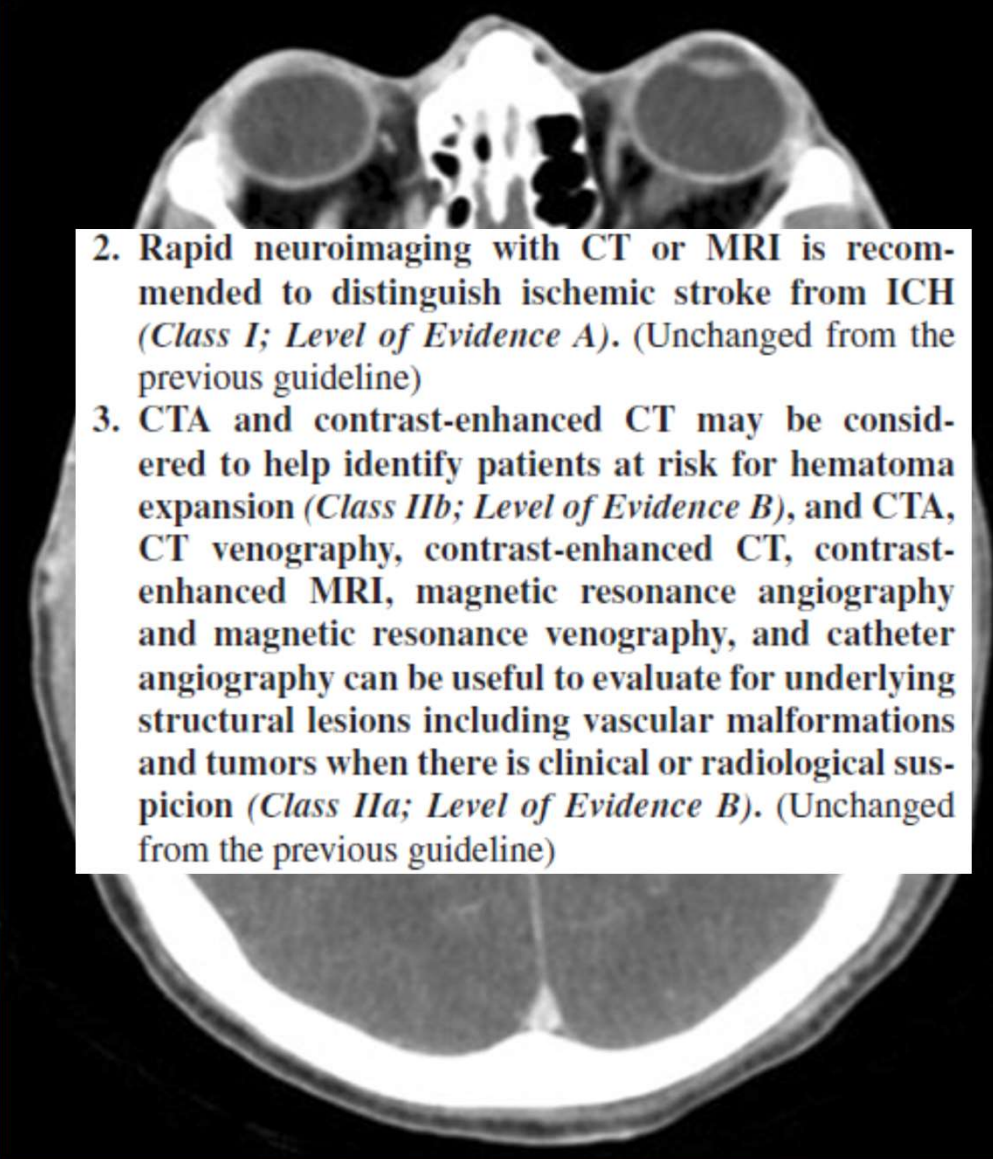
Devo fazer angio-TC?

Lobar hemorrhage

Age <55 years

No history of hypertension

Angio-TC mostrou acurácia de 89-100% para determinar causas secundárias de AVCh

Kamel, 2013 ; Delgado, 2009

2. Rapid neuroimaging with CT or MRI is recommended to distinguish ischemic stroke from ICH (*Class I; Level of Evidence A*). (Unchanged from the previous guideline)

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Practical Scoring System for the Identification of Patients with Intracerebral Hemorrhage at Highest Risk of Harboring an Underlying Vascular Etiology: The Secondary Intracerebral Hemorrhage Score

...efer, J.N. Goldstein, J. Rosand, M.H. Lev, R.G. González,

Parameter	Points
NCCT categorization[a]	
High probability	2
Indeterminate	1
Low probability	0
Age group	
18–45 years	2
46–70 years	1
≥71 years	0
Sex	
Female	1
Male	0

...%), 4 (39%), 5 (84.2%), and 6 (100%) -> risco ...cundária

...ulopatia, Moyamoya, TVC e fístula arteriovenosa

...nd specificity (72.3%) for the detection

[a] High-probability NCCT: an examination with either 1) enlarged vessels or calcifications along the margins of the ICH or 2) hyperattenuation within a dural venous sinus or cortical vein along the presumed venous drainage path of the ICH. Low-probability NCCT: an examination in which neither 1) nor 2) is present and the ICH is located in the basal ganglia, thalamus, or brain stem. Indeterminate NCCT: an examination that does not meet criteria for a high- or low-probability NCCT.

[b] Impaired coagulation defined as admission INR >3, aPTT >80 seconds, platelet count <50,000, or daily antiplatelet therapy.
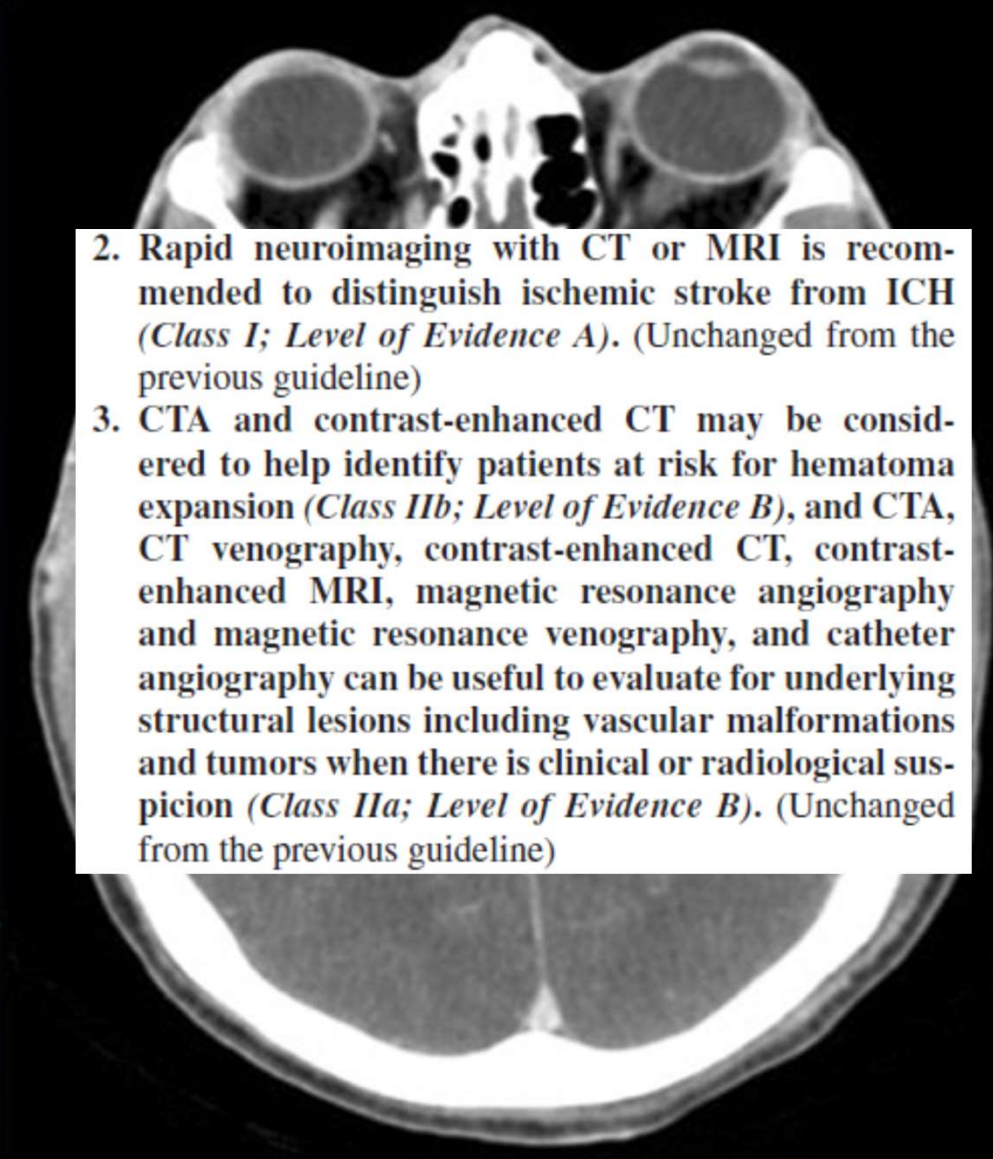
Neuroimagem

Cerca de 40% (26 +12%) das expansões ocorrem nas primeiras 20h, especialmente nas primeiras 6h (Brott, 1997)

Piora neurológica expressiva ocorre em 40% dos casos nas primeiras 48h (47% x 3%, p = 0,001)

Specogna, 2014

2. Rapid neuroimaging with CT or MRI is recommended to distinguish ischemic stroke from ICH *(Class I; Level of Evidence A)*. (Unchanged from the previous guideline)

3. CTA and contrast-enhanced CT may be considered to help identify patients at risk for hematoma expansion *(Class IIb; Level of Evidence B)*, and CTA, CT venography, contrast-enhanced CT, contrast-enhanced MRI, magnetic resonance angiography and magnetic resonance venography, and catheter angiography can be useful to evaluate for underlying structural lesions including vascular malformations and tumors when there is clinical or radiological suspicion *(Class IIa; Level of Evidence B)*. (Unchanged from the previous guideline)

Predicting Intracerebral Hemorrhage Growth
With the Spot Sign
The Effect of Onset-to-Scan Time

O que a AngioTC pode mo[strar?]
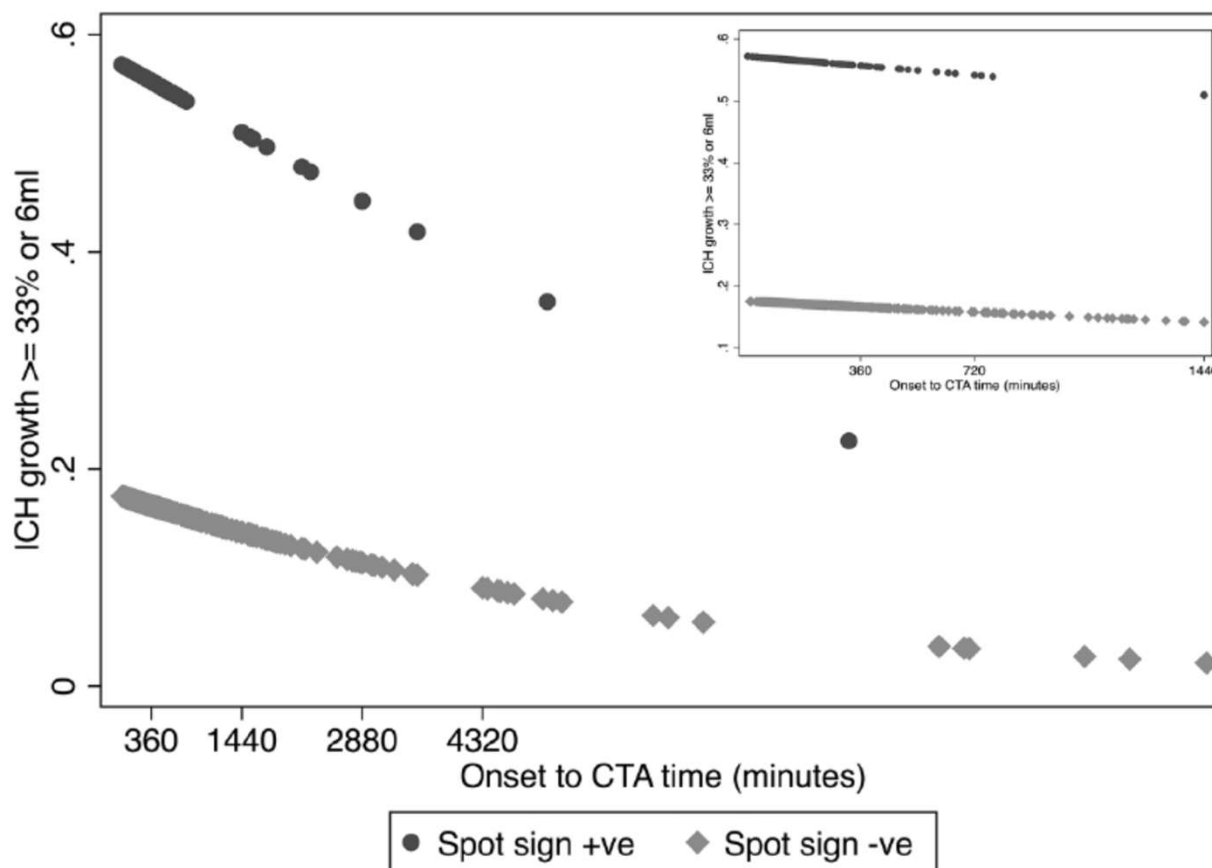
neurocritical Neurocrit Care
care
society DOI 10.1007/s12028-016-0325-z

A DAY IN THE LIFE OF A FELLOW

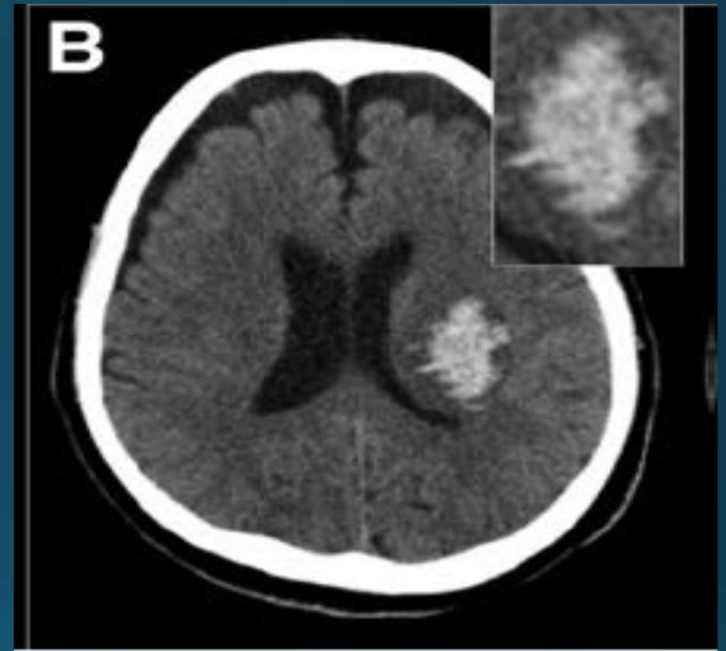**Ruptured MCA Aneurysm Presenting as Intracerebral Hemorrhage**

Christopher P. Robinson[1] · Nicholas L. Zalewski[1] · Alejandro A. Rabinstein[1]

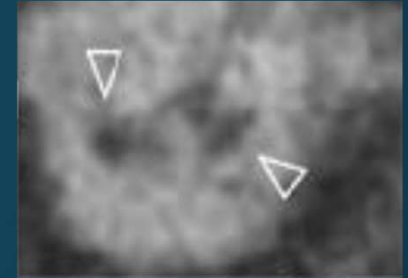# O que mais prediz expansão do hematoma?

Foram arrolados 627 pacientes

Analisadas as margens do hematoma

Hematomas com margens irregulares

Fujii et al, 1994

O que mais prediz expansão do hematoma?

Selariu et al (2012) descreveram o swirl sign em coorte de 203 pacientes com AVC

Table 2 The association between the occurrence of swirl sign and death at one month and the functional outcome according to mRS

		Swirl sign		OR (95% CI)	p-value
		Negative	Positive		
Death one month*	Yes	29 (44)	37 (56)		
	No	112 (82)	24 (18)	0.2 (0.1-0.3)	< 0.001
mRS**	Favorable	69 (86)	11 (14)		
	Unfavorable	60 (56)	48 (44)	5 (2.3-11.3)	< 0.001

Figures between parenthesis are percentage.
* The number of the missing data is 1 patient. ** The number of the missing data is 15 patients.
mRS Modified Rankin Scale, favorable outcome: mRS ≤ 3, unfavorable outcome: mRS ≥ 4.
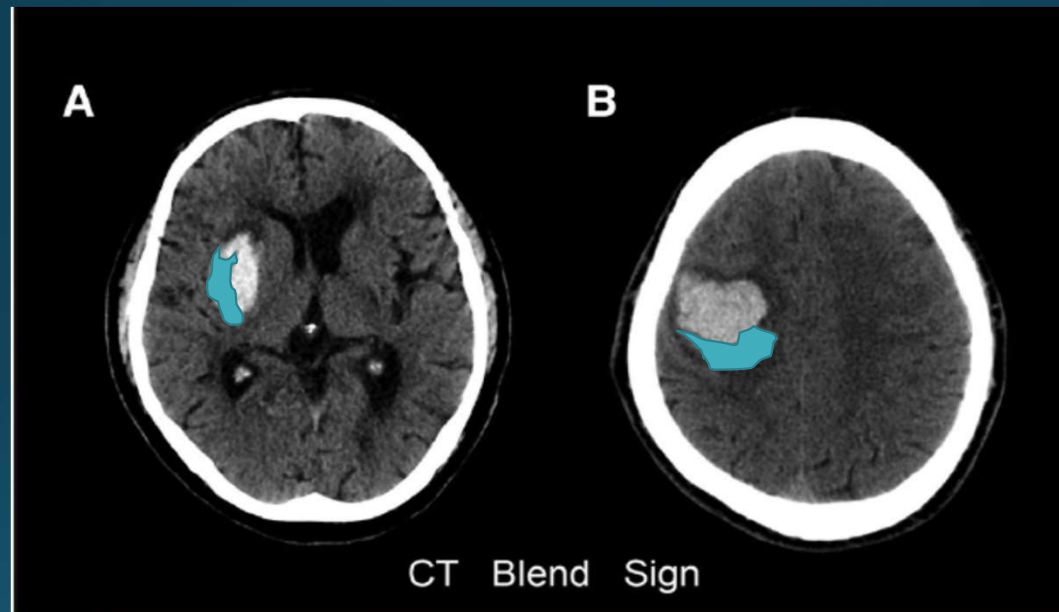OR Odds ratio. 95%, CI 95% confidence interval.

Por outro lado, hematomas pequenos não apresentavam o sinal

O que mais prediz expansão do hematoma?

The hematoma should have at least a 18 UH unit difference between the 2 density regions

>33% or >12.5 mL

CT Blend Sign

Blend Sign on Computed Tomography
Novel and Reliable Predictor for Early Hematoma Growth in Patients With Intracerebral Hemorrhage

Qi Li, MD, PhD; Gang Zhang, MD; Yuan-Jun Huang, MD; Mei-Xue Dong, MD; Fa-Jin Lv, MD, PhD; Xiao Wei, MSc; Jian-Jun Chen, MD; Li-Juan Zhang, MD; Xin-Yue Qin, MD, PhD; Peng Xie, MD

2022 Guideline for the Management of Patients
With Spontaneous Intracerebral Hemorrhage:
A Guideline From the American Heart
Association/American Stroke Association

In patients with spontaneous ICH and/or IVH, serial head
CT can be useful within the first 24 hours after symptom
onset to evaluate for hemorrhage expansion

In patients with spontaneous ICH and/or IVH and with low
GCS score or ND, serial head CT can be useful to evaluate
for hemorrhage expansion, development of hydrocephalus,
brain swelling, or herniation

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients
With Spontaneous Intracerebral Hemorrhage:
A Guideline From the American Heart
Association/American Stroke Association

The guideline incorporates CTA, which may assist with diagnosis and prognostication. The spot sign may be associated with mortality and poor mRS, score, but the data are heterogenous and have significant limitations.

Long, 2022

Complicações clínicas

Stroke
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Ten-Year Temporal Trends in Medical Complications After Acute Intracerebral Hemorrhage in the United States

Fadar Oliver Otite, MD, SM; Priyank Khandelwal, MD; Amer M. Malik, MD, MBA;
Seemant Chaturvedi, MD; Ralph L. Sacco, MD, MS; Jose G. Romano, MD

Over the study period, 29.3% of all patients and 37.1% of MV patients had at least 1 medical complication during hospitalization

In-hospital mortality decreased from 27.8% in 2004 to 21.0% in 2013
The most common complications were UTI (14.8%), ARF (8.2%), and pneumonia (7.8%)

The proportion of patients with at least 1 complication increased from 26.0% to 31.2% over the same period (relative increase 19.7%)

Notably, 61.6% of in-hospital deaths occurred in the first 3 days of admission, and 82.4% of all deaths occurred within the first week of hospitalization

Stroke

American Heart Association | American Stroke Association

Stroke Epidemiology, Patterns of Management, and Outcomes in Fortaleza, Brazil: A Hospital-Based Multicenter Prospective Study

João José Freitas de Carvalho, Monique Bueno Alves, Georgiana Álvares Andrade Viana, Cícera Borges Machado, Bento Fortunato Cardoso dos Santos, Alberto Hideki Kanamura, Claudio Luiz Lottenberg, Miguel Cendoroglo Neto and Gisele Sampaio Silva

Complicações clínicas

Ten-Year Temporal Trends in Medical Complications After Acute Intracerebral Hemorrhage in the United States

Fadar Oliver Otite, MD, SM; Priyank Khandelwal, MD; Amer M. Malik, MD, MBA; Seemant Chaturvedi, MD; Ralph L. Sacco, MD, MS; Jose G. Romano, MD

Any complication risk increased by ≈20% from 2004 to 2013

Potential explanations include more aggressive lowering of blood pressure in the acute period of ICH to prevent hematoma expansion

ATACH-II

Intensive Blood-Pressure Lowering in Patients with Acute Cerebral Hemorrhage

Adnan I. Qureshi, M.D., Yuko Y. Palesch, Ph.D., William G. Barsan, M.D., Daniel F. Hanley, M.D., Chung Y. Hsu, M.D., Renee L. Martin, Ph.D., Claudia S. Moy, Ph.D., Robert Silbergleit, M.D., Thorsten Steiner, M.D., Jose I. Suarez, M.D., Kazunori Toyoda, M.D., Ph.D., Yongjun Wang, M.D., Haruko Yamamoto, M.D., Ph.D., and Byung-Woo Yoon, M.D., Ph.D., for the ATACH-2 Trial Investigators and the Neurological Emergency Treatment Trials Network*

That aggressive blood pressure control can increase ARF risk was evidenced in the ATACH II trial

ATACH-II

Intensive Blood-Pressure Lowering
in Patients with Acute Cerebral Hemorrhage

Adnan I. Qureshi, M.D., Yuko Y. Palesch, Ph.D., William G. Barsan, M.D.,
Daniel F. Hanley, M.D., Chung Y. Hsu, M.D., Renee L. Martin, Ph.D.,
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Jose I. Suarez, M.D., Kazunori Toyoda, M.D., Ph.D., Yongjun Wang, M.D.,
Haruko Yamamoto, M.D., Ph.D., and Byung-Woo Yoon, M.D., Ph.D.,
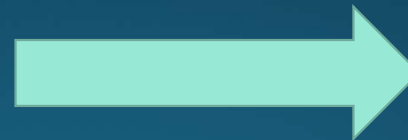for the ATACH-2 Trial Investigators and the Neurological Emergency
Treatment Trials Network*

Design

Mais de 17 anos, GCS ≥ 5 e volume estimado menor que 60ml

Randomizados 3-4,5h após o início dos sintomas

Controle de PA por 24h, pelo menos

Ao menos uma aferição de PAS ≥ 180 mmHg
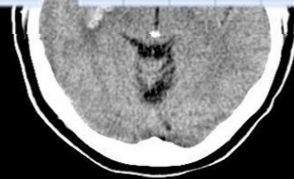
140-179 mmHg

24

110-139 mmHg

ATACH-II

Intensive Blood-Pressure Lowering in Patients with Acute Cerebral Hemorrhage

Adnan I. Qureshi, M.D., Yuko Y. Palesch, Ph.D., William G. Barsan, M.D., Daniel F. Hanley, M.D., Chung Y. Hsu, M.D., Renee L. Martin, Ph.D., Claudia S. Moy, Ph.D., Robert Silbergleit, M.D., Thorsten Steiner, M.D., Jose I. Suarez, M.D., Kazunori Toyoda, M.D., Ph.D., Yongjun Wang, M.D.,

Nicardipine 5mg/
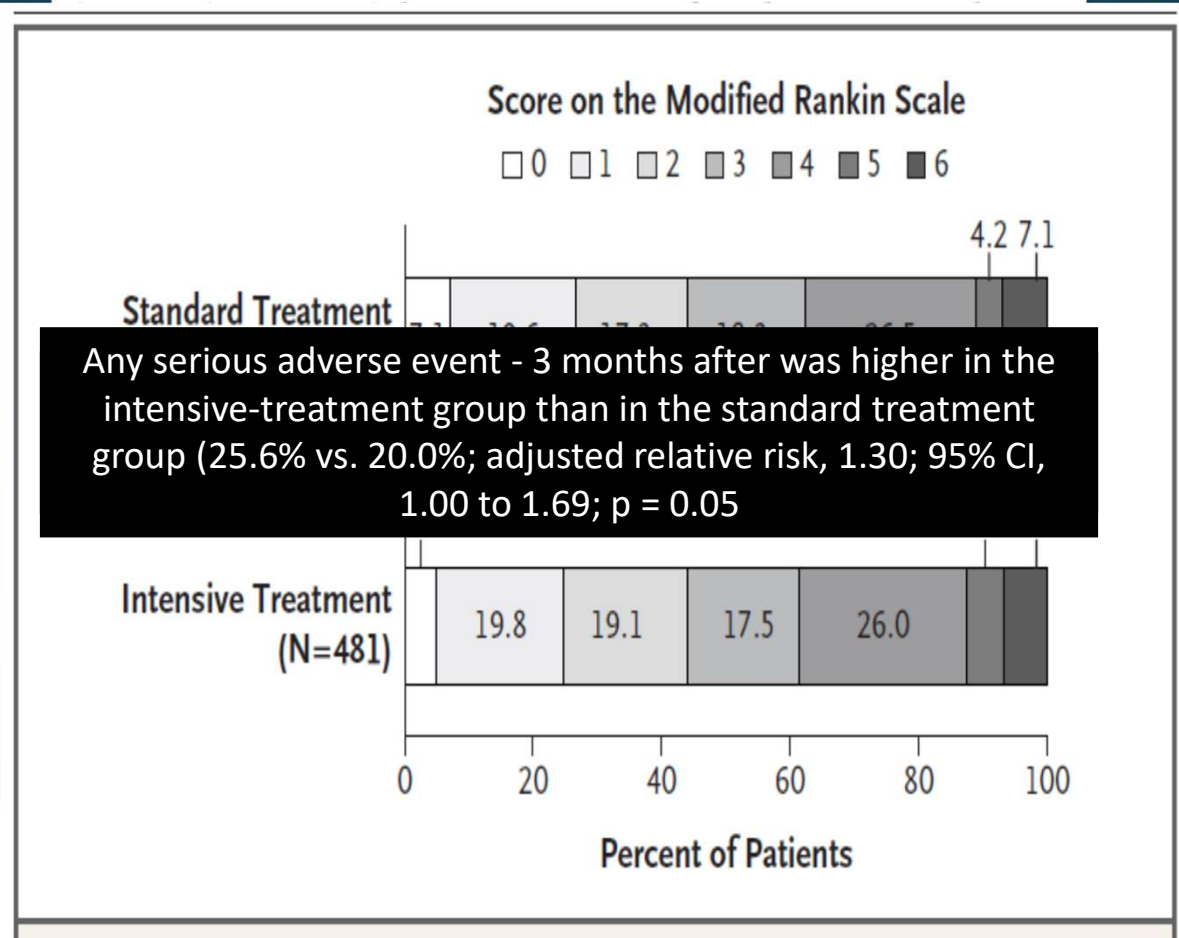+ Labetolol (o

GCS + NIHSS +mRs + EQ-5D

ATACH-II

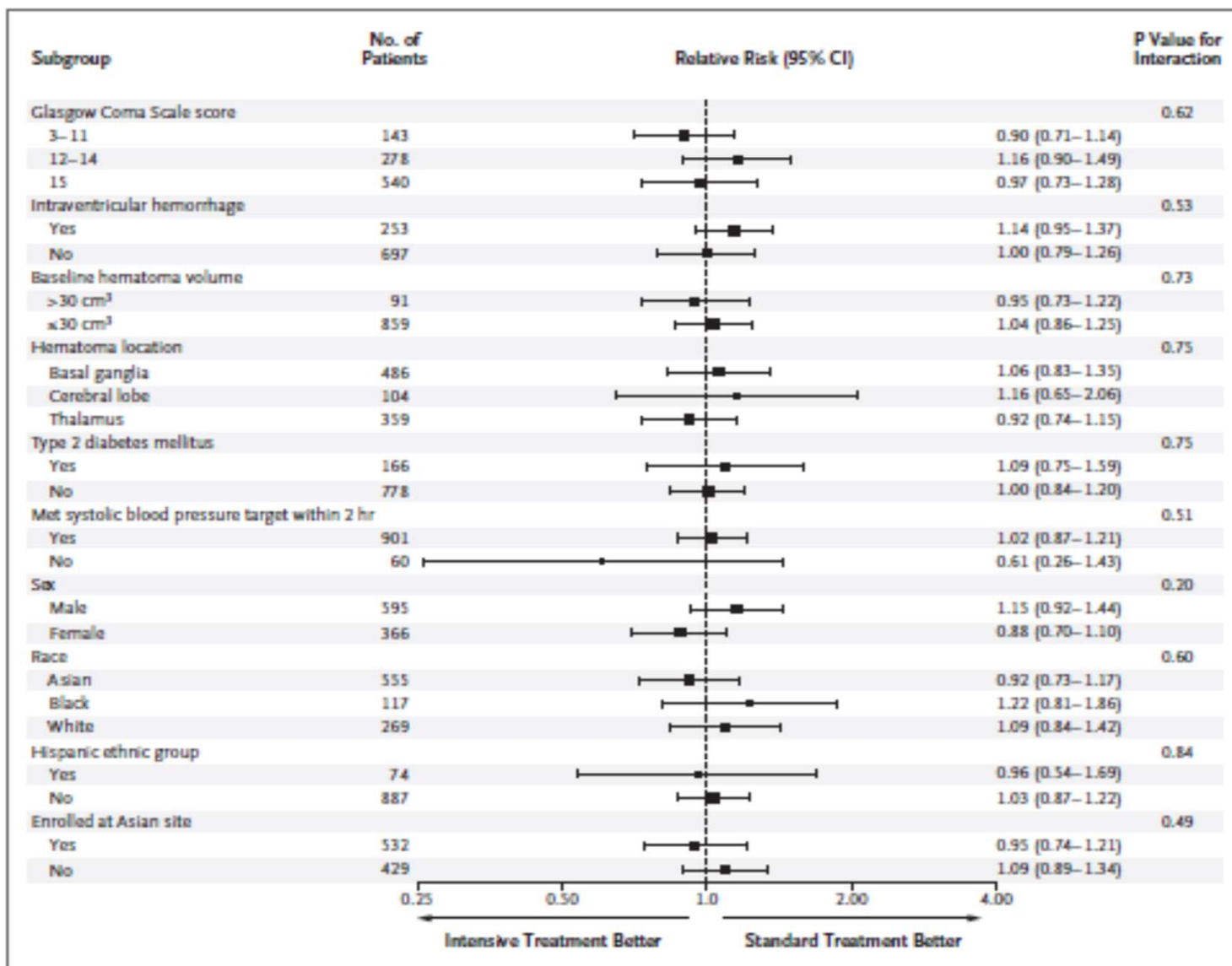## Intensive Blood-Pressure Lowering in Patients with Acute Cerebral Hemorrhage

Adnan I. Qureshi, M.D., Yuko Y. Palesch, Ph.D., William G. Barsan, M.D., Daniel F. Hanley, M.D., Chung Y. Hsu, M.D., Renee L. Martin, Ph.D., Claudia S. Moy, Ph.D., Robert Silbergleit, M.D., Thorsten Steiner, M.D., Jose I. Suarez, M.D., Kazunori Toyoda, M.D., Ph.D., Yongjun Wang, M.D., Haruko Yamamoto, M.D., Ph.D., and Byung-Woo Yoon, M.D., Ph.D., for the ATACH-2 Trial Investigators and the Neurological Emergency Treatment Trials Network*

Characteristic	Intensive Treatment (N = 500)	Standard Treatment (N = 500)
Glasgow Coma Scale score — no. (%)‡		
3–11	73 (14.6)	74 (14.8)
12–14	152 (30.4)	142 (28.4)
15	275 (55.0)	284 (56.8)
Systolic blood pressure at presentation in emergency department — mm Hg§	200±27.1	201.1±26.9
Median NIHSS score (range)¶	11 (0–40)	11 (0–40)
Intracerebral hematoma volume		
>30 cm^3 — no./total no. (%)	45/496 (9.1)	51/492 (10.4)
Median (range) — cm^3‖	10.3 (2.3–85.2)	10.2 (0.98–79.1)
Intraventricular hemorrhage — no./total no. (%)	122/496 (24.6)	142/492 (28.9)

ATACH-II

Intensive Blood-Pressure Lowering

Score on the Modified Rankin Scale

☐0 ☐1 ☐2 ☐3 ■4 ■5 ■6

Standard Treatment

4.2 7.1

Any serious adverse event - 3 months after was higher in the intensive-treatment group than in the standard treatment group (25.6% vs. 20.0%; adjusted relative risk, 1.30; 95% CI, 1.00 to 1.69; p = 0.05

Intensive Treatment (N=481)

| 19.8 | 19.1 | 17.5 | 26.0 |

0   20   40   60   80   100

Percent of Patients

Subgroup	No. of Patients	Relative Risk (95% CI)		P Value for Interaction
Glasgow Coma Scale score				0.62
3–11	143		0.90 (0.71–1.14)	
12–14	278		1.16 (0.90–1.49)	
15	540		0.97 (0.73–1.28)	
Intraventricular hemorrhage				0.53
Yes	253		1.14 (0.95–1.37)	
No	697		1.00 (0.79–1.26)	
Baseline hematoma volume				0.73
>30 cm³	91		0.95 (0.73–1.22)	
≤30 cm³	859		1.04 (0.86–1.25)	
Hematoma location				0.75
Basal ganglia	486		1.06 (0.83–1.35)	
Cerebral lobe	104		1.16 (0.65–2.06)	
Thalamus	359		0.92 (0.74–1.15)	
Type 2 diabetes mellitus				0.75
Yes	166		1.09 (0.75–1.59)	
No	778		1.00 (0.84–1.20)	
Met systolic blood pressure target within 2 hr				0.51
Yes	901		1.02 (0.87–1.21)	
No	60		0.61 (0.26–1.43)	
Sex				0.20
Male	595		1.15 (0.92–1.44)	
Female	366		0.88 (0.70–1.10)	
Race				0.60
Asian	555		0.92 (0.73–1.17)	
Black	117		1.22 (0.81–1.86)	
White	269		1.09 (0.84–1.42)	
Hispanic ethnic group				0.84
Yes	74		0.96 (0.54–1.69)	
No	887		1.03 (0.87–1.22)	
Enrolled at Asian site				0.49
Yes	532		0.95 (0.74–1.21)	
No	429		1.09 (0.89–1.34)	

0.25   0.50   1.0   2.00   4.00

← Intensive Treatment Better   Standard Treatment Better →

Figure 3. Unadjusted Relative Risk of Death or Disability at 3 Months, According to Subgroup.

Mas já apareceu algo de positivo?

INTERACT2

- Foram 2839 pacientes com HIC admitidos em até 6 horas após o início dos sintomas;
- Target c...ei... pacientes...-2... manten... d... próximo...
- Realizad...
- GCS > 5...
- Hematoma extenso ou abordagem cirúrgica foram excluídos;

Medicação IV e PO, variável

Median NIHSS score (range)¶	11 (0–40)	11 (0–40)
Intracerebral hematoma volume		
>30 cm^3 — no./total no. (%)	45/496 (9.1)	51/492 (10.4)
Median (range) — cm^3‖	10.3 (2.3–85.2)	10.2 (0.98–79.1)
Intraventricular hemorrhage — no./total no. (%)	122/496 (24.6)	142/492 (28.9)

ATACH II

Subgroup	Intensive Treatment	Guideline-Recommended Treatment	Odds Ratio (95% CI)	P Value for Homogeneity
	no. of events (%)			
Age				0.76
<65 yr	340 (43.3)	352 (46.7)		0.87 (0.71–1.06)
≥65 yr	379 (63.6)	433 (65.7)		0.91 (0.72–1.15)
Region				0.97
China	431 (45.8)	480 (49.6)		0.86 (0.72–1.03)
Other	288 (65.5)	305 (68.7)		0.86 (0.65–1.14)
Time to randomization				0.48
<4 hr	435 (54.3)	465 (56.7)		0.91 (0.75–1.10)
≥4 hr	284 (48.9)	320 (54.1)		0.81 (0.65–1.02)
Baseline systolic blood pressure				0.90
<180 mm Hg	372 (50.0)	400 (53.8)		0.86 (0.70–1.05)
≥180 mm Hg	347 (54.4)	385 (57.6)		0.88 (0.70–1.09)
History of hypertension				0.12
Yes	524 (52.5)	555 (54.3)		0.93 (0.78–1.11)
No	194 (50.7)	228 (58.9)		0.72 (0.54–0.95)
Baseline NIHSS score				0.48
<15	393 (39.8)	440 (44.3)		0.83 (0.70–0.99)
≥15	324 (82.9)	341 (83.4)		0.96 (0.67–1.40)
Baseline hematoma volume				0.57
<15 ml	285 (39.3)	309 (42.0)		0.90 (0.73–1.10)
≥15 ml	383 (69.1)	416 (73.4)		0.81 (0.63–1.05)
Baseline hematoma location				0.76
Deep	568 (53.1)	614 (56.9)		0.86 (0.73–1.02)
Others	100 (47.6)	111 (49.8)		0.92 (0.63–1.34)
Total	719 (52.0)	785 (55.6)		0.87 (0.75–1.01)

0.5   1.0   2.0

Intensive Treatment Better — Guideline-Recommended Treatment Better

E o que fazer com a PA?

PAS admis... ...4ommHg de

PAS admis... ...onitorização

BP: Recon...

1. For IC... and 2... acute... mm H... be eff... IIa; L... guidel...
2. For IC... it may... tion o... and f... Evider...

...een 150... ation to... to 140... and can... e (Class... previous...

mm Hg,... e reduc-... infusion... Level of...
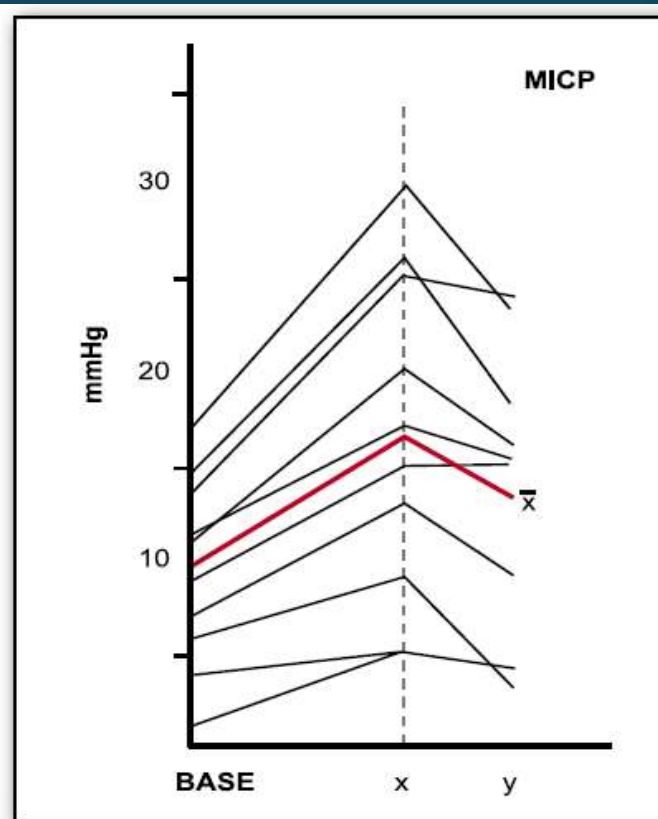
Figure 4. Changes in intracranial pressure with nitroprusside

MICP graph: mmHg axis (10, 20, 30); BASE, x, y axis

Nicardipina, Labetolol,
Nitroprussiato...

In patients with spontaneous ICH requiring acute BP lowering, careful titration to ensure continuous smooth and sustained control of BP, avoiding peaks and large variability in SBP, can be beneficial for improving functional outcomes

Long, 2022

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients With Spontaneous Intracerebral Hemorrhage: A Guideline From the American Heart Association/American Stroke Association

In patients with spontaneous ICH in whom acute BP lowering is considered, initiating treatment within 2 hours of ICH onset and reaching target within 1 hour can be beneficial to reduce the risk of HE and improve functional outcome

Long, 2022

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients
With Spontaneous Intracerebral Hemorrhage:
A Guideline From the American Heart
Association/American Stroke Association
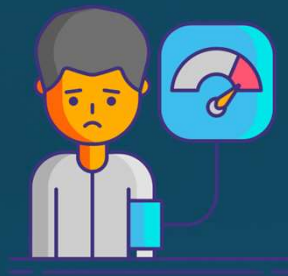
In patients with spontaneous ICH of mild to moderate severity presenting with SBP
between 150 and 220 mm Hg, acute lowering of SBP to a target of 140 mm Hg with
the goal of maintaining in the range of 130 to 150 mm Hg is safe and may be
reasonable for improving functional outcomes

Long, 2022

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients
With Spontaneous Intracerebral Hemorrhage:
A Guideline From the American Heart
Association/American Stroke Association

In patients with spontaneous ICH of mild to moderate severity presenting with SBP
>150 mm Hg, acute lowering of SBP to <130 mm Hg is potentially harmful.

For those with higher BPs, decrease
that BP by 20% in the first hour

Long, 2022

ORIGINAL ARTICLE

A Multicenter Comparison of Outcomes Associated with Intravenous Nitroprusside and Nicardipine Treatment Among Patients with Intracerebral Hemorrhage

Table 2 Multivariate-adjusted risk of mortality among patients with intracerebral hemorrhage treated with either intravenous nicardipine or nitroprusside (Premier data set, 2005–2006)

	Total patients	Events N (%)	Odds ratio (95% confidence interval)		
			Crude	Baseline risk mortality algorithm adjusted	Baseline risk mortality algorithm and hospital characteristics adjusted
Nicardipine	926	261 (28%)	Reference	Reference	Reference
Nitroprusside	530	202 (38%)	1.6 (1.3–2.0) $P < 0.0001$	1.7 (1.3–2.2) $P = 0.0003$	1.6 (1.2–2.1) $P = 0.001$

Chama a neurocirurgia?

Minimally Invasive Surgery plus rt-PA for Intracerebral Hemorrhage Evacuation (MISTIE) Decreases Perihematomal Edema

W. Andrew Mould, B.A.[*,1], J. Ricardo Carhuapoma, M.D.[*,2], John Muschelli, ScM[3], Karen Lane, C.C.R.P.[1], Timothy C Morgan, M.P.H.[1], Nichol A McBee, M.P.H.[1], Amanda J Bistran-Hall, B.S.[1], Natalie L Ullman, B.S.[1], Paul Vespa, M.D.[4], Neil A Martin, M.D.[4], Issam Awad, M.D.[5], Mario Zuccarello, M.D.[6], and Daniel F. Hanley, M.D.[1] For the MISTIE investigators

(...) testing imageguided catheter-based removal of blood clot in subjects with hypertensive ICH

Foram 27 centros

69 pacientes -> rt-PA + aspiração

10 pacientes -> aspiração

42 pacientes com tratamento medico *padrão*
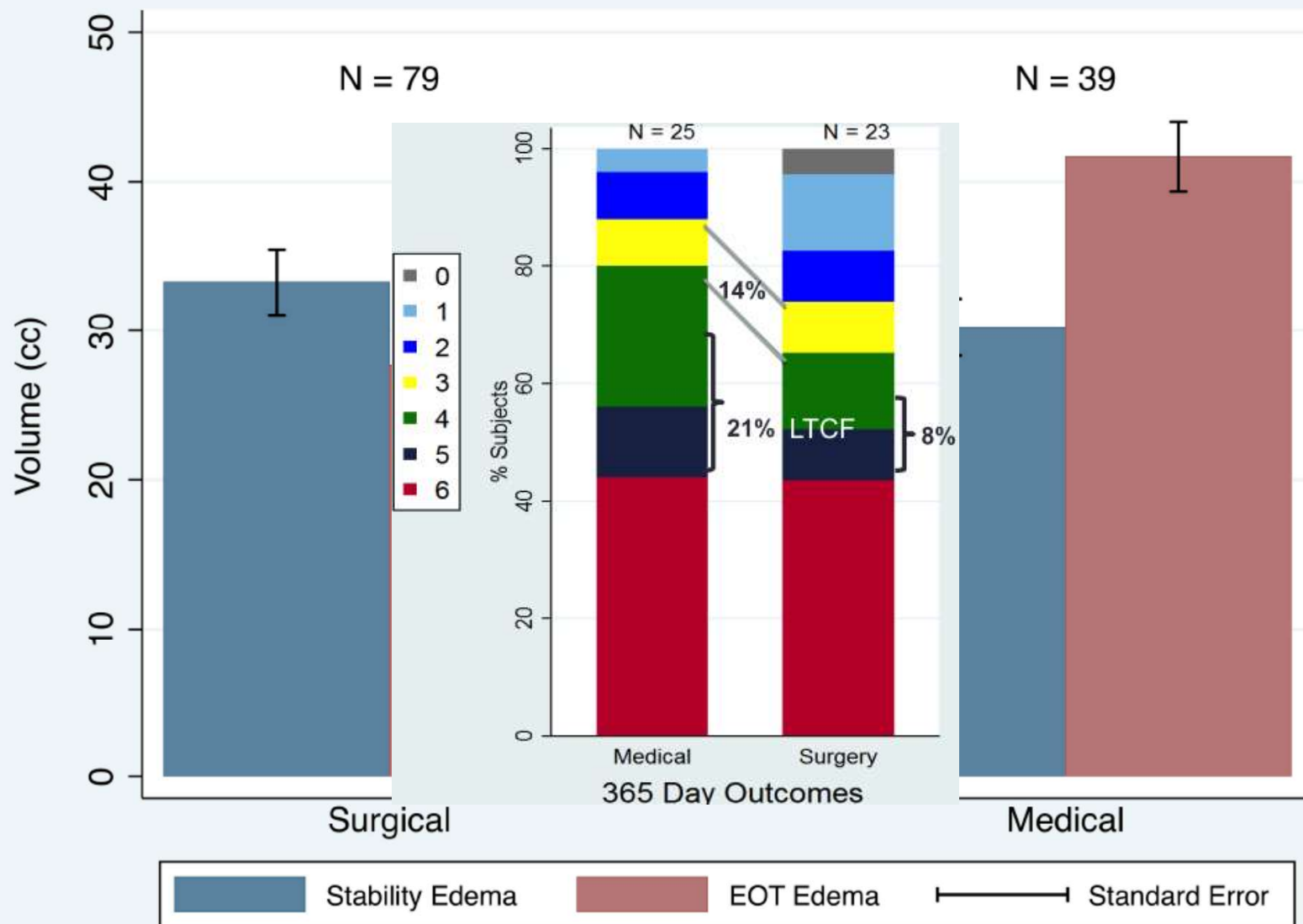
for one hour before opening to resume drainage.

CLEAR-III

mRS

☐ mRS
☐ mRS
☐ mRS
☐ mRS

100

sIVH 20-50 cc
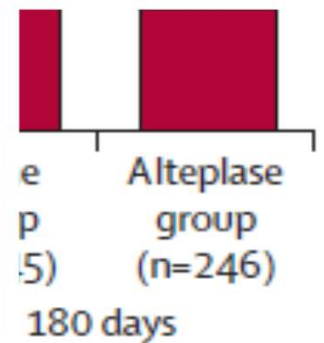
Odds ratio

Age (years) <65
Age (years) ≥65
Women
Men
White
African American

Rnd <48 h Sx onset
Rnd 48–60 h Sx onset
Rnd >60 h Sx onset

0   2   4   6

← Favours saline   Favours alteplase →

Salir
grou
(n=24

e
p
5)

Alteplase
group
(n=246)

180 days

Early surgery versus initial conservative treatment in patients with spontaneous supratentorial lobar intracerebral haematomas (STICH II): a randomised trial

A David Mendelow, Barbara A Gregson, Elise N Rowan, Gordon D Murray, Anil Gholkar, Patrick M Mitchell, for the STICH II Investigators

- Foram 129 centros em 39 países;
- Incluídos os paicientes:
  - spontaneous lobar intracerebral haemorrhage on CT scan (≤1 cm from the cortical surface of the brain) with a volume of between 10 mL and 100 mL,

  - without intraventricular blood,

  - Were within 48 h of ictus,

  - Had a best motor score on the Glasgow Coma Score (GCS) of 5 or 6,

  - and had a best eye score of 2 or more (ie, were conscious at randomisation)
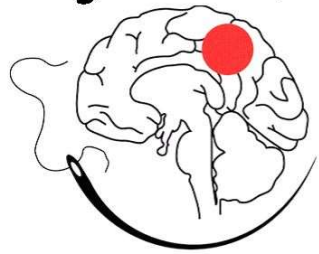
	Early surgery group	Initial conservative treatment group	p value	Absolute difference (95% CI)
Primary outcome	297	286		
Prognosis based			0·367*	3·7% (–4·3 to 11·6)
Unfavourable	174 (59%)	178 (62%)	..	..
Favourable	123 (41%)	108 (38%)	..	..
Secondary outcomes	298	291		
Mortality at 6 months			0·095*	5·6% (–1·0 to 12·2)
Dead	54 (18%)	69 (24%)	..	..
Alive	244 (82%)	222 (76%)	..	..
Prognosis-based modified Rankin			0·456*	3·1% (–5·0 to 11·2)
Unfavourable	155 (53%)	158 (56%)	..	..
Favourable	140 (47%)	126 (43%)	..	..
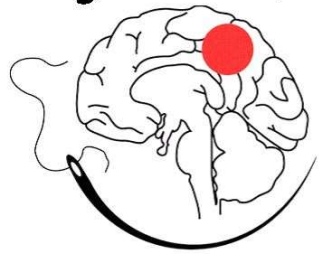
	Early surgery group	Initial conservative treatment group	p value	Absolute difference (95% CI)
GOSE			0·091*; 0·075†	..
Dead	54 (18%)	69 (24%)	..	..
Vegetative	0	0	..	..
Lower severe disability	64 (22%)	66 (23%)	..	..
Upper severe disability	72 (24%)	59 (21%)	..	..
Lower moderate disability	20 (7%)	15 (5%)	..	..
Upper moderate disability	32 (11%)	35 (12%)	..	..
Lower good recovery	37 (12%)	26 (9%)	..	..
Upper good recovery	18 (6%)	16 (6%)	..	..
Rankin			0·128*; 0·147†	..
0	20 (7%)	16 (6%)	..	..
1	54 (18%)	57 (20%)	..	..
2	58 (20%)	41 (14%)		..
3	35 (12%)	32 (11%)	..	..
4	40 (14%)	28 (10%)	..	..
5	34 (12%)	41 (14%)	..	..
Dead	54 (18%)	69 (24%)	..	..
EuroQoL Index	235	210	0·751‡	..
Median (IQR; range)	0·64 (0·20 to 0·85; −0·59 to 1·00)	0·69 (0·08 to 0·82; −0·59 to 1·00)	..	..

S.T.I.C.H. II

Early surgery

Dead | Lower severe disability | Lower moderate disability | Lower good recovery

Lobar haematomas with no intraventricular haemorrhage (assuming Auer intraventricular haemorrhage distributed evenly between treatment groups)

Study	Surgery	Conservative	OR (95% CI)
Auer, et al[11] (1989)	8/21	12/18	0·31 (0·08–1·15)
Juvela, et al[14] (1989)	3/3	0/3	49·00 (0·74–3236·99)
Zuccarello, et al[17] (1999)	1/3	1/3	1·00 (0·03–29·81)
Chen, et al[13] (2001)	7/11	9/13	0·78 (0·14–4·27)
Teernstra, et al[18] (2001)	15/16	7/9	4·29 (0·33–55·59)
Mendelow, et al[20] (2005)	66/112	90/128	0·61 (0·36–1·03)
Mendelow (STICH II), et al (2013)	190/297	194/286	0·84 (0·60–1·19)
Subtotal (95% CI)	**463**	**460**	**0·78 (0·59–1·02)**

Total events: 290 (surgery), 313 (conservative)

Test for heterogeneity: $\chi^2=8·43$, df=6 (p=0·21), $I^2=28·8\%$

Test for overall effect: Z=1·81 (p=0·07)

0·1 0·2 0·5 1·0 2·0 5·0 10·0

Favours surgery   Favours conservative
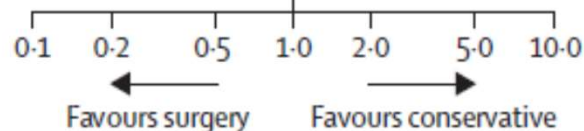
treatment

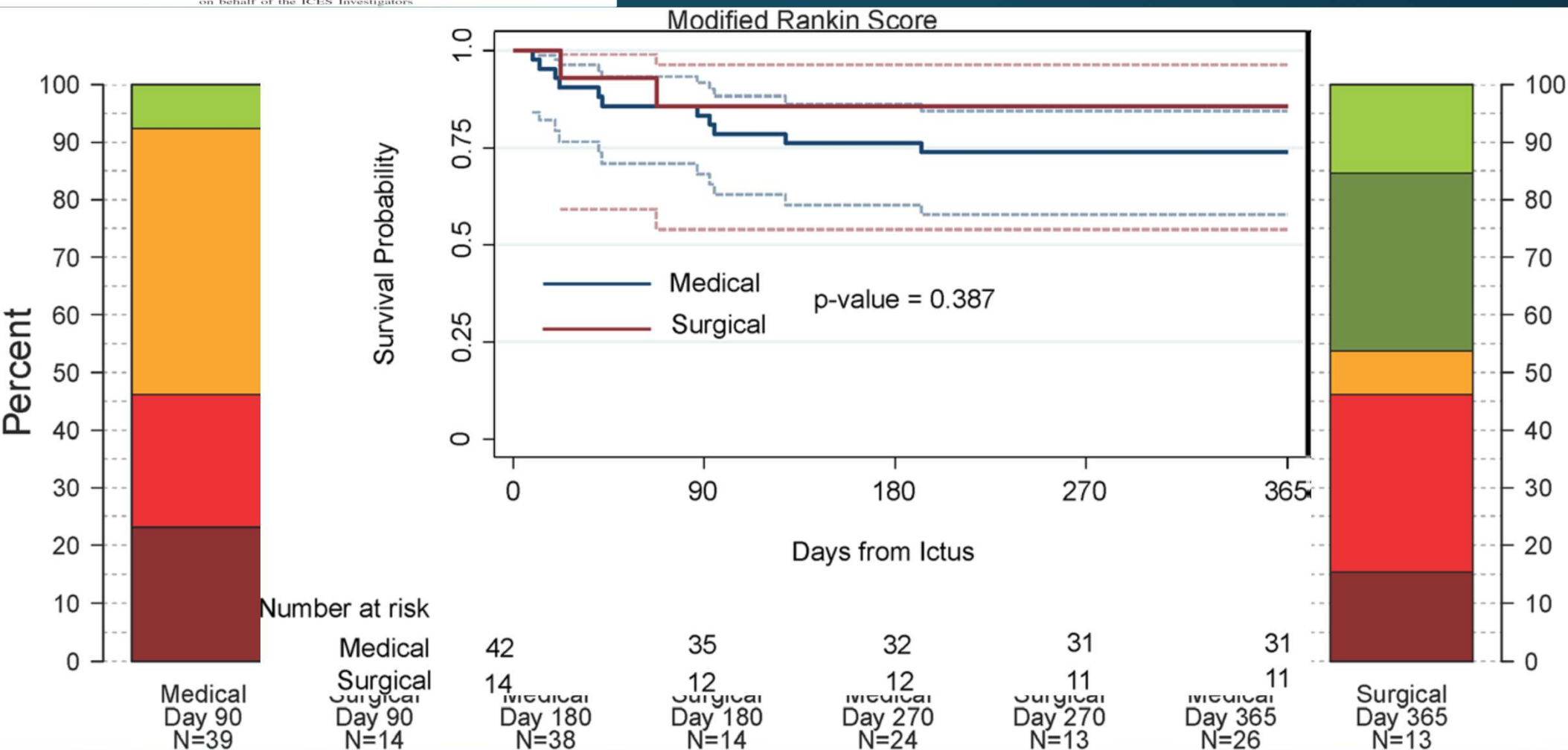# ICES (Intraoperative Stereotactic Computed Tomography-Guided Endoscopic Surgery) for Brain Hemorrhage

A Multicenter Randomized Controlled Trial

Paul Vespa, MD; Daniel Hanley, MD; Joshua Betz, MS; Alan Hoffer, MD;
Johnathan Engh, MD; Robert Carter, MD; Peter Nakaji, MD; Chris Ogilvy, MD;
Jack Jallo, MD; Warren Selman, MD; Amanda Bistran-Hall, BS; Karen Lane, CMA;
Nichol McBee, MPH; Jeffery Saver, MD; Richard E. Thompson, PhD; Neil Martin, MD;
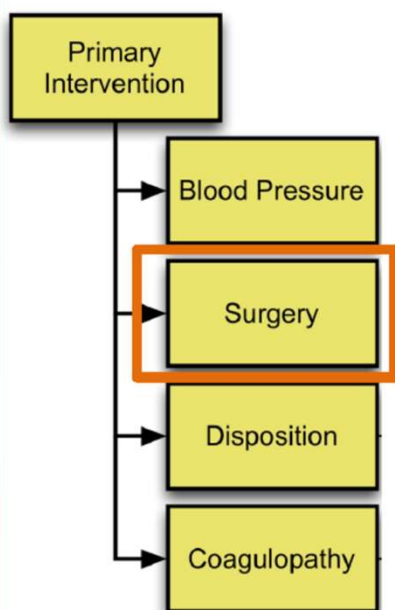on behalf of the ICES Investigators

ICES (Intraoperative Stereotactic Computed Tomography-Guided Endoscopic Surgery) for Brain Hemorrhage
A Multicenter Randomized Controlled Trial

Paul Vespa, MD; Daniel Hanley, MD; Joshua Betz, MS; Alan Hoffer, MD;
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Nichol McBee, MPH; Jeffery Saver, MD; Richard E. Thompson, PhD; Neil Martin, MD;
on behalf of the ICES Investigators

Então...

Location	Surgery urgently:
Cerebellum	• **Declining neuro exam** • **Size > 3 cm, or** • **Compressive effects brainstem, or** • **hydrocephalus**
Lobar	**ICH causing mass effect/herniation in severely affected but salvageable patient and as a life-saving measure**

Da Pian R, Bazzan A, Pasqualin A. Surgical versus medical treatment of spontaneous posterior fossa haematomas: a cooperative study on 205 cases. *Neurol Res* 1984;6:145-151.

Firsching R, Huber M, Frowein RA. Cerebellar haemorrhage: management and prognosis. *Neurosurg Rev* 1991;14:191-194

Então...

Nas lesões supratentoriais, ainda é incerto o benefício da abordagem

Hematoma evacuation might be considered as a life-saving measure in patients with supratentorial hemorrhage showing neurological deterioration (Hemphill, 2015)

Então...

IVH: Recommendations

1. Although intraventricular administration of rtPA in IVH appears to have a fairly low complication rate, the efficacy and safety of this treatment are uncertain *(Class IIb; Level of Evidence B)*. (Revised from the previous recommendation)

2. The efficacy of endoscopic treatment of IVH is uncertain *(Class IIb; Level of Evidence B)*. (New recommendation)
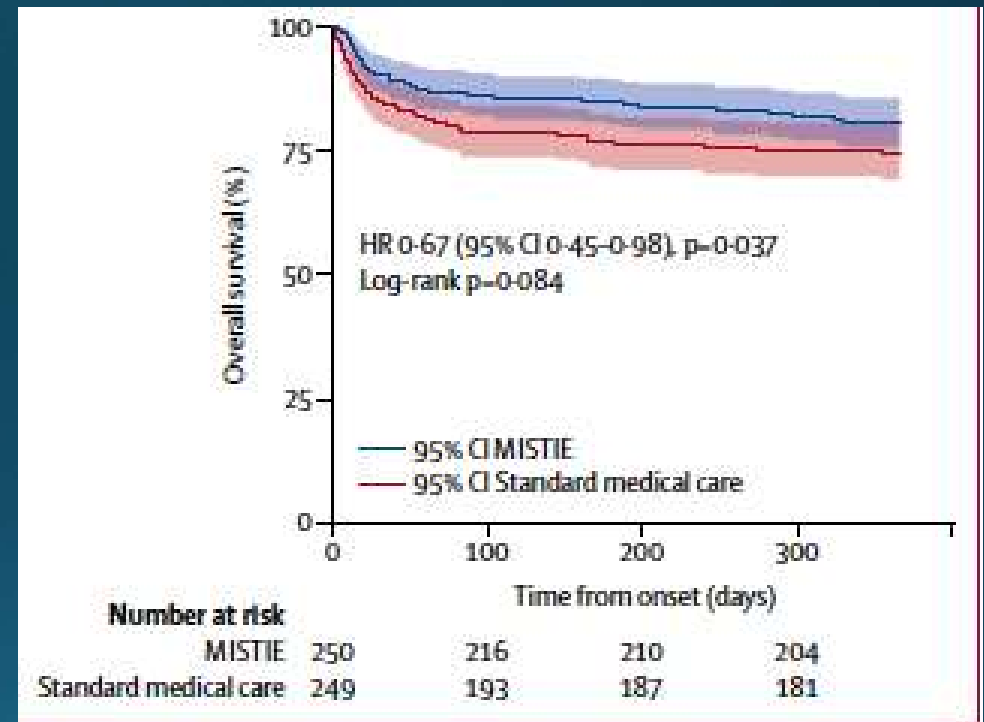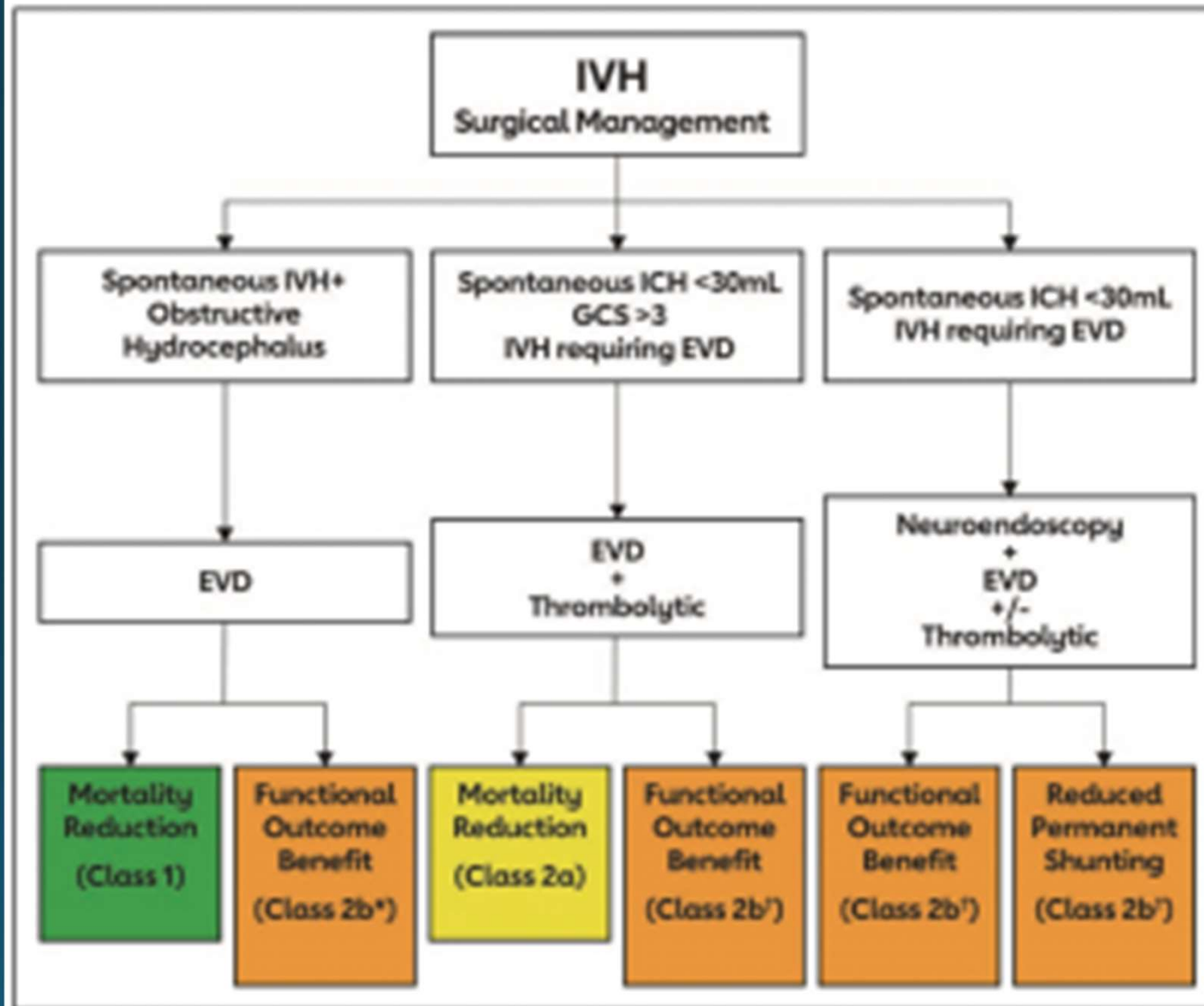
Hydrocephalus with or without IVH -> Drenagem ventricular + rt-PA (?)

Aguardemos o MISTIE III...

MISTIE III Trial

Efficacy and safety of minimally invasive surgery with thrombolysis in intracerebral haemorrhage evacuation (MISTIE III): a randomised, controlled, open-label, blinded endpoint phase 3 trial

Highlights

Uso de anticoagulantes orais

Antiagregação prévia aumenta volume do hematoma e aumenta mortalidade

(Filbot, 2004)

Warfarina é responsável por 9-14% dos eventos, com incidência de 0,3-3,7%/ano no INR 2-4,5

(Steiner, 2006)

> 70 anos + antiplaquetário + hipertensão -> Risco aumentado para HIP relacionado à Warfarina

(Manoel, 2016)

4-CP 20 UI/kg -> keep INR < 1,4

Fator VIIa isoladamente não é recomendado na HIP

(Hemphill, 2015)

Heparinas

Se infusão nas 3h anteriores, Protamina 1mg/100UI de Heparina não fracionada;

ado

1mg : 50mg

Se infusão entre 8-12h, Protamina (60%) 0,5mg : 1mg de heparina de baixo peso, máximo de 50mg

Frontera, 2016

Guideline for Reversal of Antithrombotics in Intracranial Hemorrhage

A Statement for Healthcare Professionals from the Neurocritical Care Society and Society of Critical Care Medicine

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Heparinas

Dabigatrana
Inibição da trombina / IIa

Se infusão dentro de 3-5h meias-vidas, **Idarucizumab** / Praxbind ® 2,5-0-2,5mg

Frontera, 2016

Rivaroxabana
Mediadores do fator Xa

Aripazine e Adexanet

Complexo protrombínico 50U/kg

Se administrado em < 2h -> Ácido tranexâmico ou épsilon-aminocaproic acid

Frontera, 2016

Antiagregante

Aspirina

Clopidogrel

DDAVP 0,4mcg/kg, IV

Transfusão de plaqueta nos pacientes que podem se submeter a tto cirúrgico

Frontera, 2016

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients
With Spontaneous Intracerebral Hemorrhage:
A Guideline From the American Heart
Association/American Stroke Association

In patients with VKA-associated spontaneous ICH and INR ≥2.0, 4-factor (4-F) prothrombin complex concentrate (PCC) is recommended in preference to fresh-frozen plasma (FFP) to achieve rapid correction of INR and limit HE

In patients with VKA-associated spontaneous ICH, intravenous
vitamin K should be administered directly after coagulation
factor replacement (PCC or other) to prevent later increase in
INR and subsequent HE

In patients with VKA-associated spontaneous ICH with INR of

1.3 to 1.9, it may be reasonable to use PCC to achieve
rapid correction of INR and limit HE

AHA/ASA GUIDELINE

2022 Guideline for the Management of Patients With Spontaneous Intracerebral Hemorrhage: A Guideline From the American Heart Association/American Stroke Association
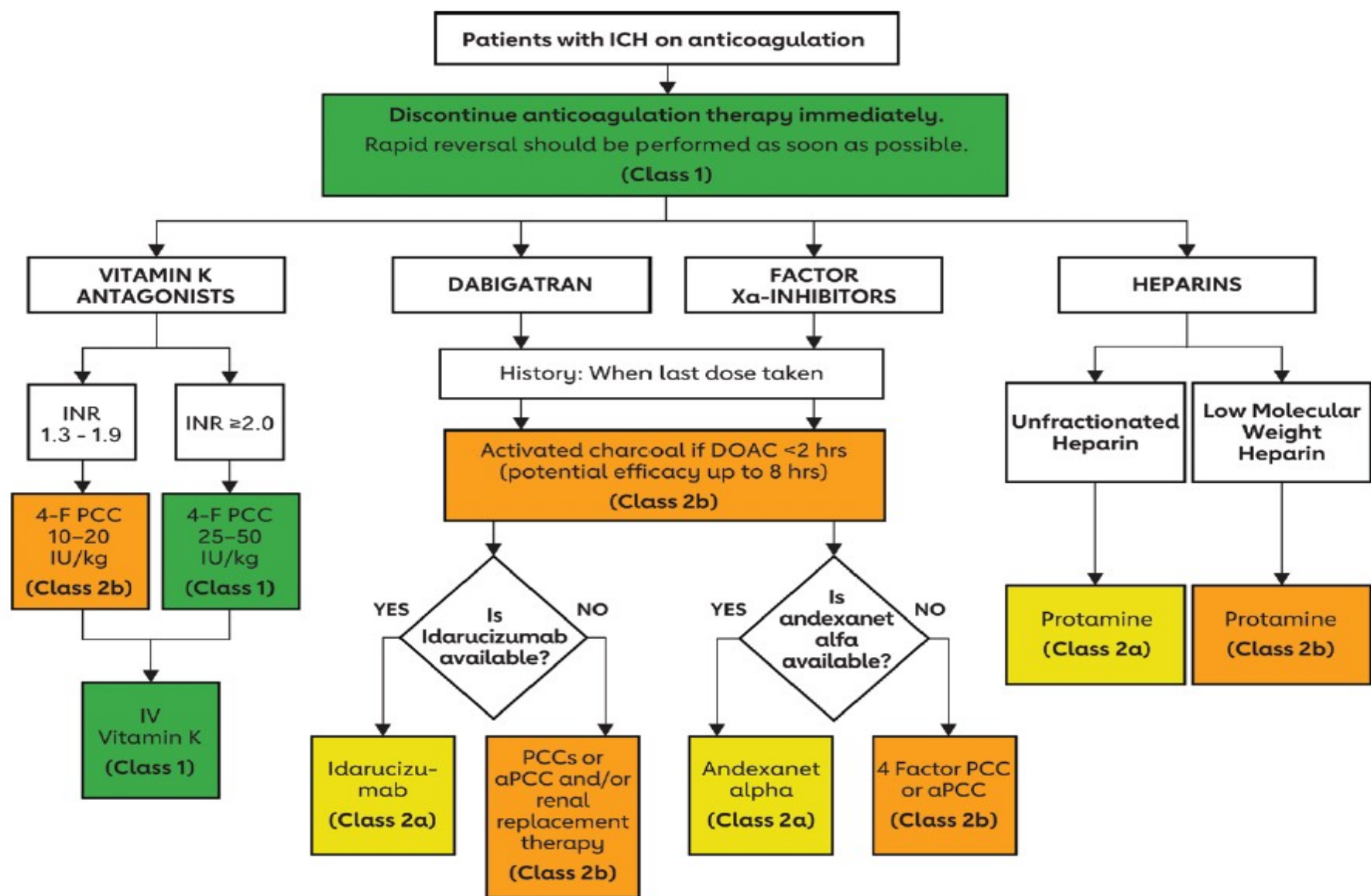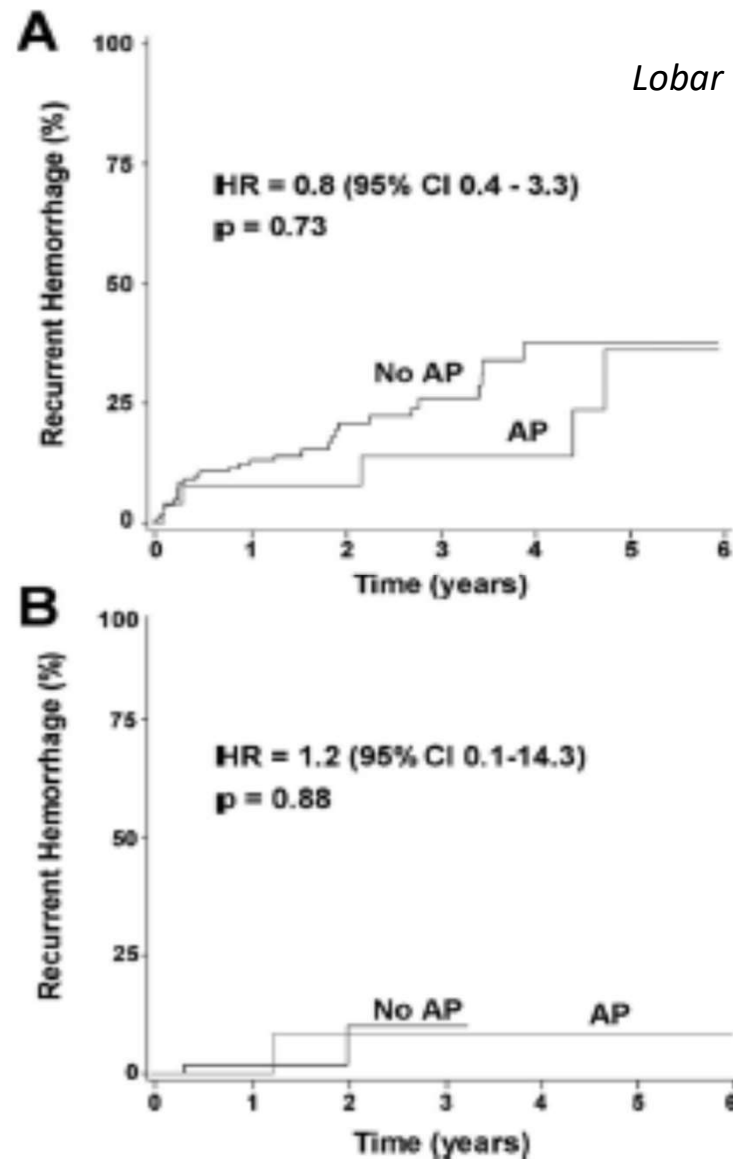
For patients with spontaneous ICH being treated with aspirin and who require emergency neurosurgery, platelet transfusion might be considered to reduce postoperative bleeding and mortality.

Patients with ICH on anticoagulation

Discontinue anticoagulation therapy immediately.
Rapid reversal should be performed as soon as possible.
(Class 1)

VITAMIN K ANTAGONISTS

INR 1.3 – 1.9 → 4-F PCC 10–20 IU/kg (Class 2b)

INR ≥2.0 → 4-F PCC 25–50 IU/kg (Class 1)

IV Vitamin K (Class 1)

DABIGATRAN

History: When last dose taken

Activated charcoal if DOAC <2 hrs (potential efficacy up to 8 hrs) (Class 2b)

Is Idarucizumab available?
- YES → Idarucizumab (Class 2a)
- NO → PCCs or aPCC and/or renal replacement therapy (Class 2b)

FACTOR Xa-INHIBITORS

Is andexanet alfa available?
- YES → Andexanet alpha (Class 2a)
- NO → 4 Factor PCC or aPCC (Class 2b)

HEPARINS

Unfractionated Heparin → Protamine (Class 2a)

Low Molecular Weight Heparin → Protamine (Class 2b)

Preciso an...

Anticoagulatio[n] ...let monotherapy
after any ICH ...when there are
strong indicati... ...vel of Evidence B)

Lobar

A
HR = 0.8 (95% CI 0.4 - 3.3)
p = 0.73

No AP

AP

Recurrent Hemorrhage (%)
Time (years)

B
HR = 1.2 (95% CI 0.1-14.3)
p = 0.88

No AP   AP

Recurrent Hemorrhage (%)
Time (years)

Long-term antithrombotic treatment in intracranial hemorrhage survivors with atrial fibrillation

D

Study or subgroup	Weight	Rate ratio IV, random, 95% CI
Reference 09	67.4%	0.91 (0.50, 1.64)
Reference 12	2.9%	0.17 (0.01, 3.00)
Reference 13	4.1%	3.00 (0.27, 33.08)
Reference 14	1.5%	0.25 (0.00, 12.68)
Reference 15	24.0%	0.48 (0.18, 1.30)
Total (95% CI)	100.0%	0.77 (0.47, 1.25)

Favors APA   Favors no antithrombotic

Heterogeneity: Tau² = 0.00; Chi² = 3.74, df = 4 (p = 0.44); I² = 0%
Test for overall effect: Z = 1.08 (p = 0.28)
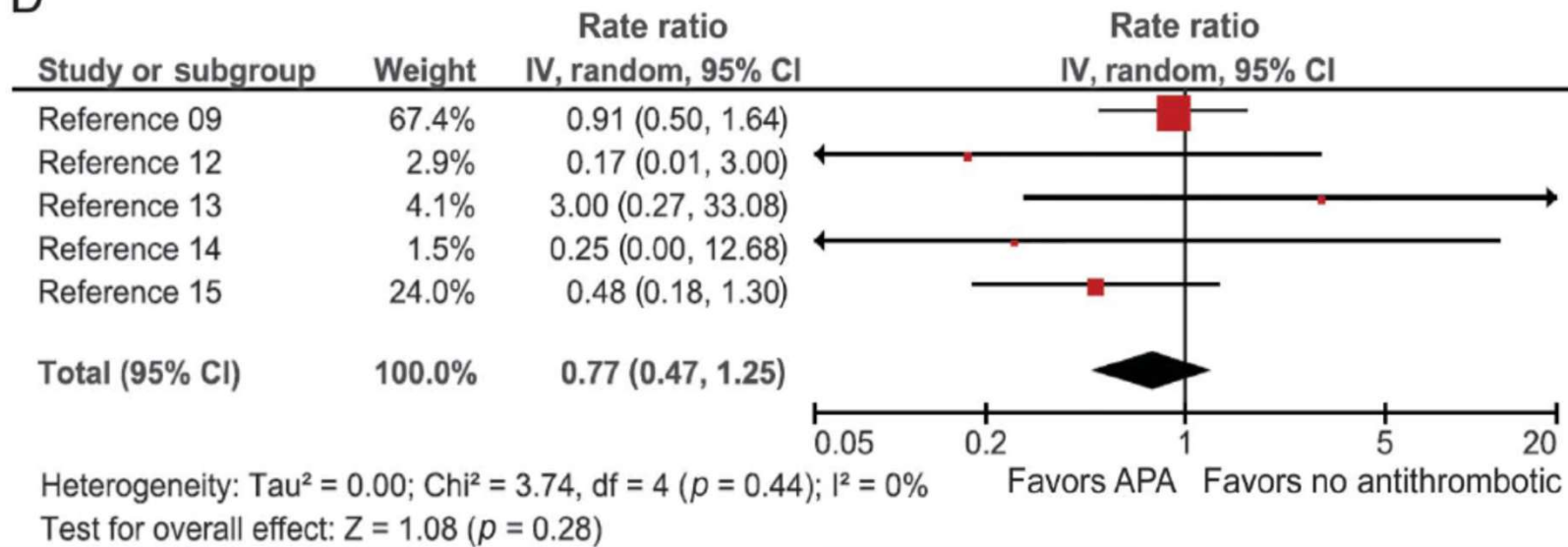
Glicemia

Variable	Dead ≤28 days (n = 127)	Alive >28 days (n = 202)	p value
Blood glucose (mmol/l)			
Nondiabetic	9.1 (0.3)	6.8 (0.2)	<0.0001
Diabetic	12.8 (1.3)	9.3 (0.9)	0.029

No. of Patients

	Base-line				
Conventional control	2995	2233	1380	909	583
Intensive control	2989	2260	1428	908	562

Day after Randomization

No. at Risk

Conventional control	3014	2379	2304	2261
Intensive control	3016	2337	2227	2182

Days after Randomization

Temperatura

Fig. 1 Proportion of fever ($T \geq 37.5$ °C) during the period by hematoma grow modified Rankin Scale (1 4–6). (*$p \leq 0.01$, **$p \leq$
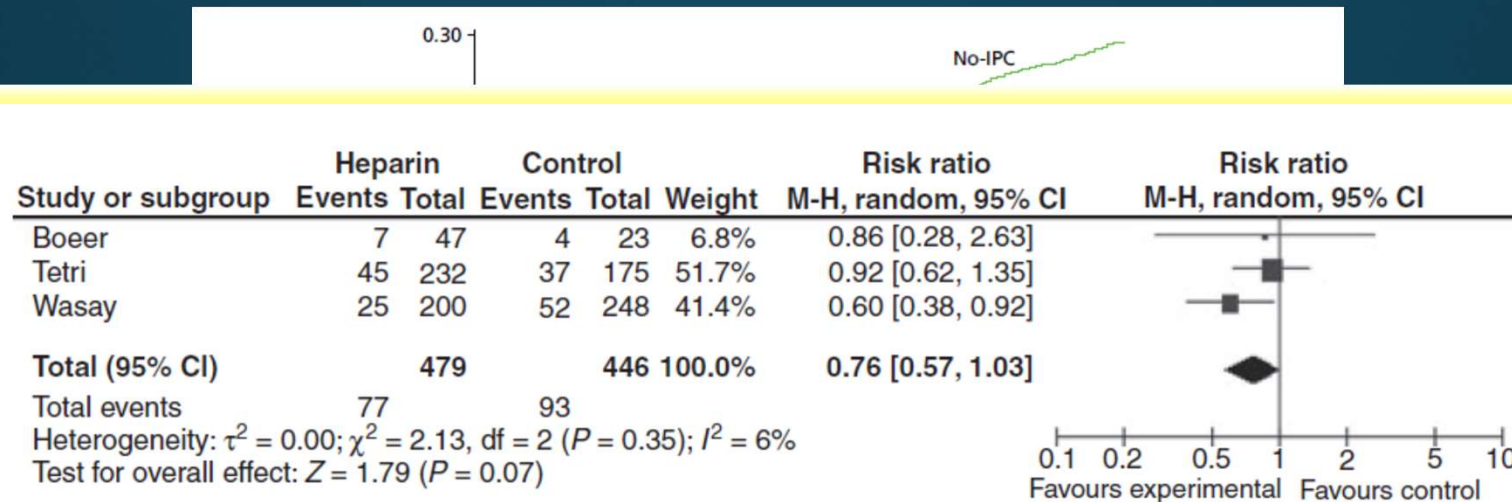
Hematoma growth	No $N = 219$	Yes $N = 63$	p value
Atrial fibrillation	11 (5)	8 (12)	0.04
Hypertension	179 (82)	58 (92)	0.04
Anticoagulation (warfarin)	8 (4)	9 (14)	0.004
INR	0.9 (0.9–1.1)	1.1 (0.9–1.3)	0.002
Fever baseline	1 (0.4 %)	1 (2 %)	NS
Fever 24 h	28 (13)	16 (29)	0.009
Fever 48 h	46 (22)	17 (32)	NS
Fever 72 h	30 (14)	19 (31)	0.004
Cumulative delta-temperature °C at 72 h*	0.3 (0–0.8)	0.5 (0–1.7)	0.08

		24	48	72	168
■ HG	2	29	32	31	17
◩ No HG	0.5	13	22	14	10
▢ mRS 4-6	0	21	31	22	17
⊡ mRS 1-3	0	7	18	13	6

Time after onset of ICH (hours)

Profilaxia TEV

Fig. 5. Death due to any cause in studies comparing anticoagulants with treatments other than anticoagulants (elastic stockings, intermittent pneumatic compression or placebo) for the prevention of thromboembolic events.

Heparinas de baixo peso (40mg/d) ou não fracionada (5000ui, 12-12h) -> 1-4 dias no *follow-up*, sem sangramento

Crise

A incidência de crise é de 2,5 a 28% (Hu et al., 2014)

Profilaxia diminuiu a incidência de crises (Passero, 2012)

Profilaxia não diminuiu a incidência de crises (Gilad, 2011)

Mas parece ter melhorado o exame neurológico (Gilad, 2011)

Crise

Antiepileptic Drugs for Patients with Intracerebral Hemorrhage: A Meta-Analysis

Zhong YAO, Lu MA, Chao YOU

West China Hospital, Department of Neurosurgery, Chengdu, Sichuan, China

Crise

Antiepileptic Drugs for Patients with Intracerebral Hemorrhage: A Meta-Analysis

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West China Hospital, Department of Neurosurgery, Chengdu, Sichuan, China

- Crise precoce ->   < 1 semana
- Crise tardia ->   > 1 semana

    - *Outcome* secundário
        - mRs > 4
        - NIHSS > 14
        - Necessidade de cuidados de enfermagem constantes
        - Morte

Crise

Forest plot depicting pooled odds ratio for early seizure occurrence; p<0.05 is considered statistically significant for Z-test
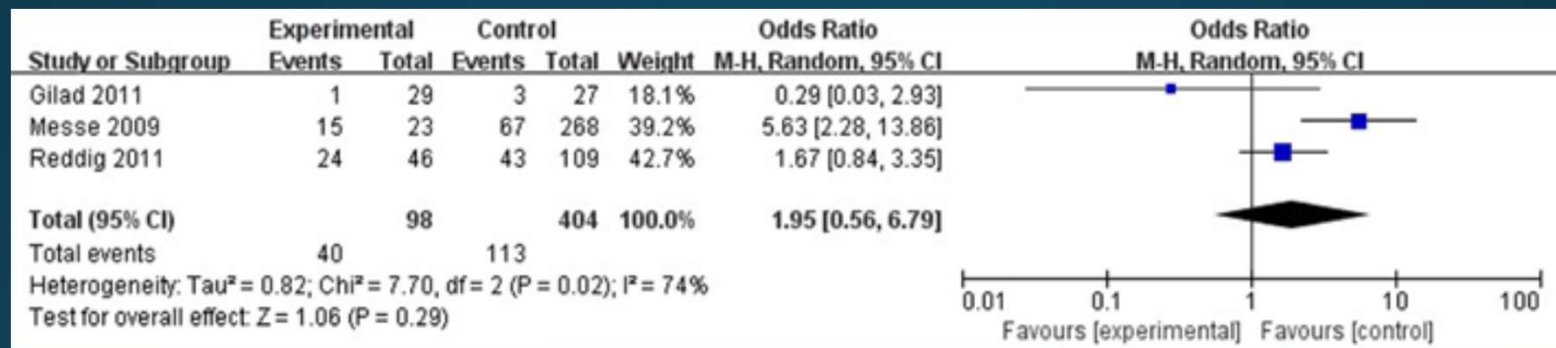
Forest plot depicting pooled odds ratio for poor outcome; p<0.05 is considered statistically significant for Z-test

Crise

Evolving use of seizure medications after intracerebral hemorrhage

A multicenter study

Andrew M. Naidech, MD, MSPH
Jennifer Beaumont, MS
Babak Jahromi, MD, PhD
Shyam Prabhakaran, MD, MS
Abel Kho, MD, MS
Jane L. Holl, MD, MPH
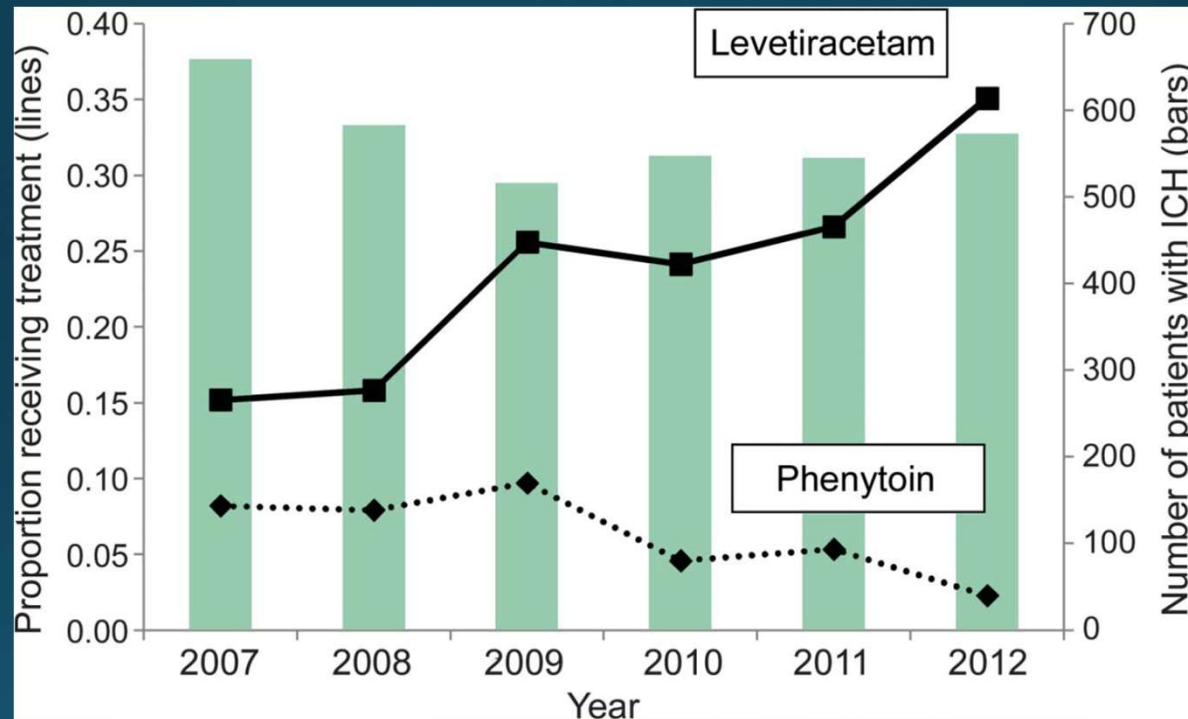
Crise

Prophylactic Anticonvulsants in Intracerebral Hemorrhage

Jason Mackey[1,2] · Ashley D. Blatsioris[1] · Elizabeth A. S. Moser[3] ·
Ravan J. L. Carter[2] · Chandan Saha[3] · Alec Stevenson[1] · Abigail L. Hulin[1] ·
Darren P. O'Neill[4] · Aaron A. Cohen-Gadol[5] · Thomas J. Leipzig[5] ·
Linda S. Williams[1,2,6]

Table 2 Predictors of prophylactic anticonvulsant initiation

Model	OR (95% CI)	p value
Age	0.97 (0.95, 0.99)	<.001
Craniotomy		.002
Yes	3.06 (1.51, 6.20)	
No	1.00 (–)	
Initial NIHSS		.001
≤7 (median)	1.00 (–)	
>7	2.31 (1.40, 3.79)	
Lobar		<.001
Yes	2.94 (1.76, 4.91)	
No	1.00 (–)	
Prior ICH		.028
Yes	2.36 (1.10, 5.07)	
No	1.00 (–)	

CI confidence interval, *ICH* intracerebral hemorrhage, *NIHSS* NIH Stroke Scale, *OR* odds ratio

Crise

Análise univar... mRs ≥ 4) na alta

Prophylactic Anticonvulsants in Intracerebral Hemorrhage

Jason Mac... Ravan J. ... Darren P. ... Linda S. ...

Table 5 Predictors of poor outcome (mRS 4–6) at hospital discharge

Model	OR (95% CI)	p value
Prophylactic anticonvulsant		.424
Yes	1.41 (0.61, 3.29)	
No	1.00 (–)	
Initial NIHSS		<.001
≤11 (median)	1.00 (–)	
>11	13.95 (4.80, 40.50)	
ICH volume (mL)		.007
Q1 (0–6.0)	1.00 (–)	
Q2 (6.1–18.6)	2.02 (0.72, 5.66)	
Q3 (18.7–43.3)	2.24 (0.73, 6.84)	
Q4 (43.4–130.6)	19.28 (3.58, 103.71)	
Intraventricular extension		.006
Yes	3.33 (1.41, 7.88)	
No	1.00 (–)	
Baseline mRS		.008
0–1	1.00 (–)	
2–3	5.05 (1.53, 16.66)	

CI confidence interval, *ICH* intracerebral hemorrhage, *mRS* modified Rankin score, *NIHSS* NIH Stroke Scale, *OR* odds ratio

Prophylactic an...		.417
Yes		
No		

Crise

Alguém se beneficia?

Lesões corticais, jovens e envolvimento lobar (Gilad, 2011)

Crise

Seizures and Antiseizure Drugs: Recommendations

4. Prophylactic antiseizure medication is not recommended *(Class III; Level of Evidence B).* (Unchanged from the previous guideline)

Quando retomar o antiagregante?

RESTART

>18 anos de idade

Que já tomavam antiagregante ou anticoagulante

Início em ~76 dias

Acompanhados por até 5 anos (mediana de 2 anos)

Effects of antiplatelet therapy after stroke due to intracerebral haemorrhage (RESTART): a randomised, open-label trial

RESTART Collaboration
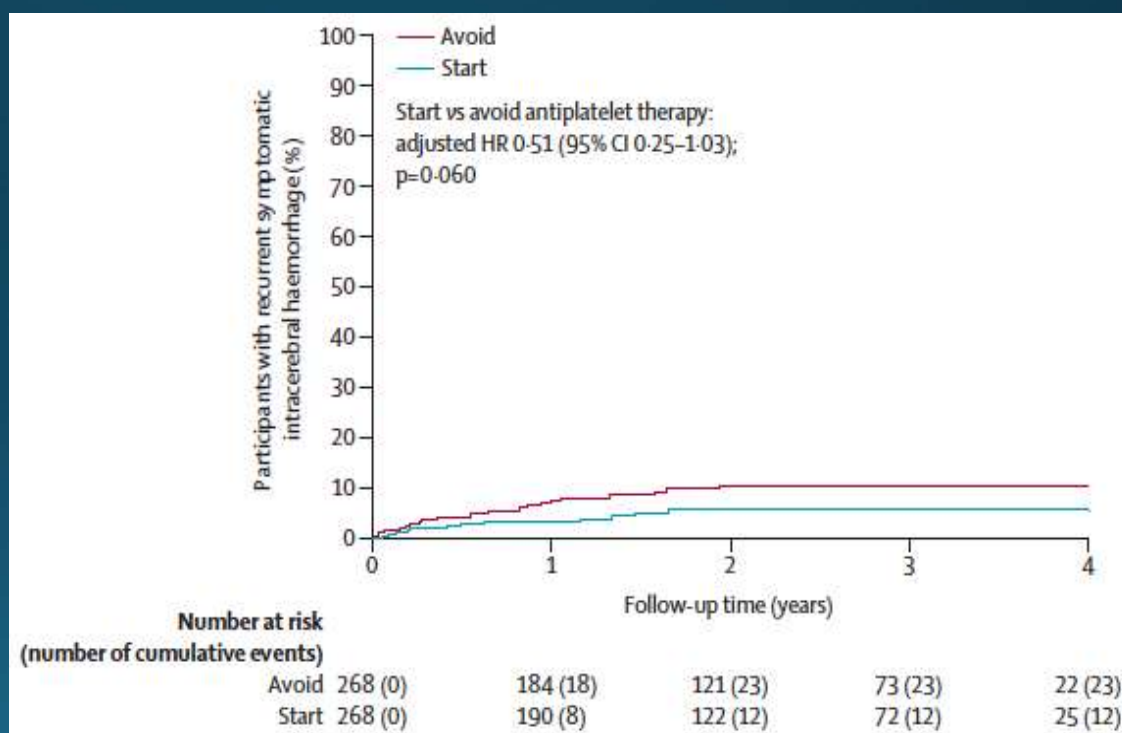
Take home message

- Escalas – funcionalidade e óbito – usar ICH e FUNC Score

- Avaliação por imagem – realizar TC ; angio-TC para todos é uma opção ; repetir a imagem em 6h e 24h

- Spot sign é associado à expansão do hematoma

Take home message

- Complicações clínicas – tem diminuído, exceto IRA

- Controle de PA – manter em torno de 140 x 90 mmHg

- Abordagem cirúrgica – ainda incerto; realizar nos desvios de linha média com piora neurológica. Fossa posterior deve ser abordada em hematomas > 3cm ou 14ml

- Reversão nas discrasias – plaqueta para < 100000 e casos cirúrgicos. Reverter quando INR > 1,4 – Plasma fresco ou fator recombinante 3 ou 4 fatores

Take home message

- Temperatura – febre aumenta hematoma e a mortalidade

- Glicemia – não fazer hiperglicemia desde a admissão

- Profilaxia de crise – não precisa fazer; alto risco parece se beneficiar

Obrigado

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