

A randomized trial on Hemodynamic Optimization of cerebral Perfusion after Endovascular therapy in patients with acute ischemic stroke (**HOPE** study)

HOPE Improving cerebral perfusion after stroke

Current status of the HOPE trial

Pol Camps-Renom
On behalf of the HOPE team



**NEUROLOGY
DEPARTMENT**
HOSPITAL DE LA SANTA CREU
| SANT PAU | FROM 1882



SANT PAU
Campus Salut
Barcelona



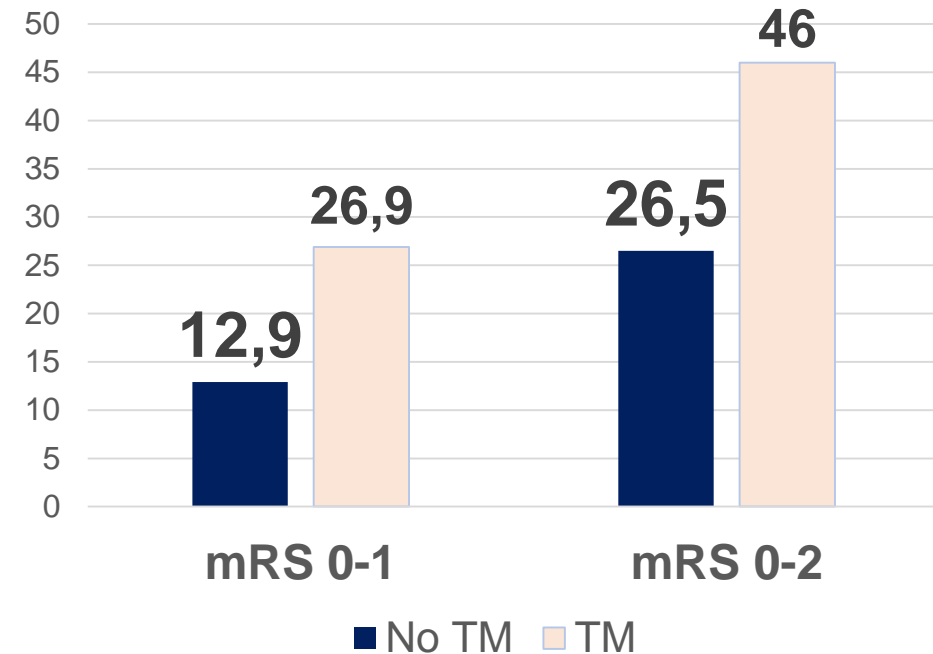
Institut
de Recerca[®]
Sant Pau

HUPE Improving cerebral
perfusion after stroke

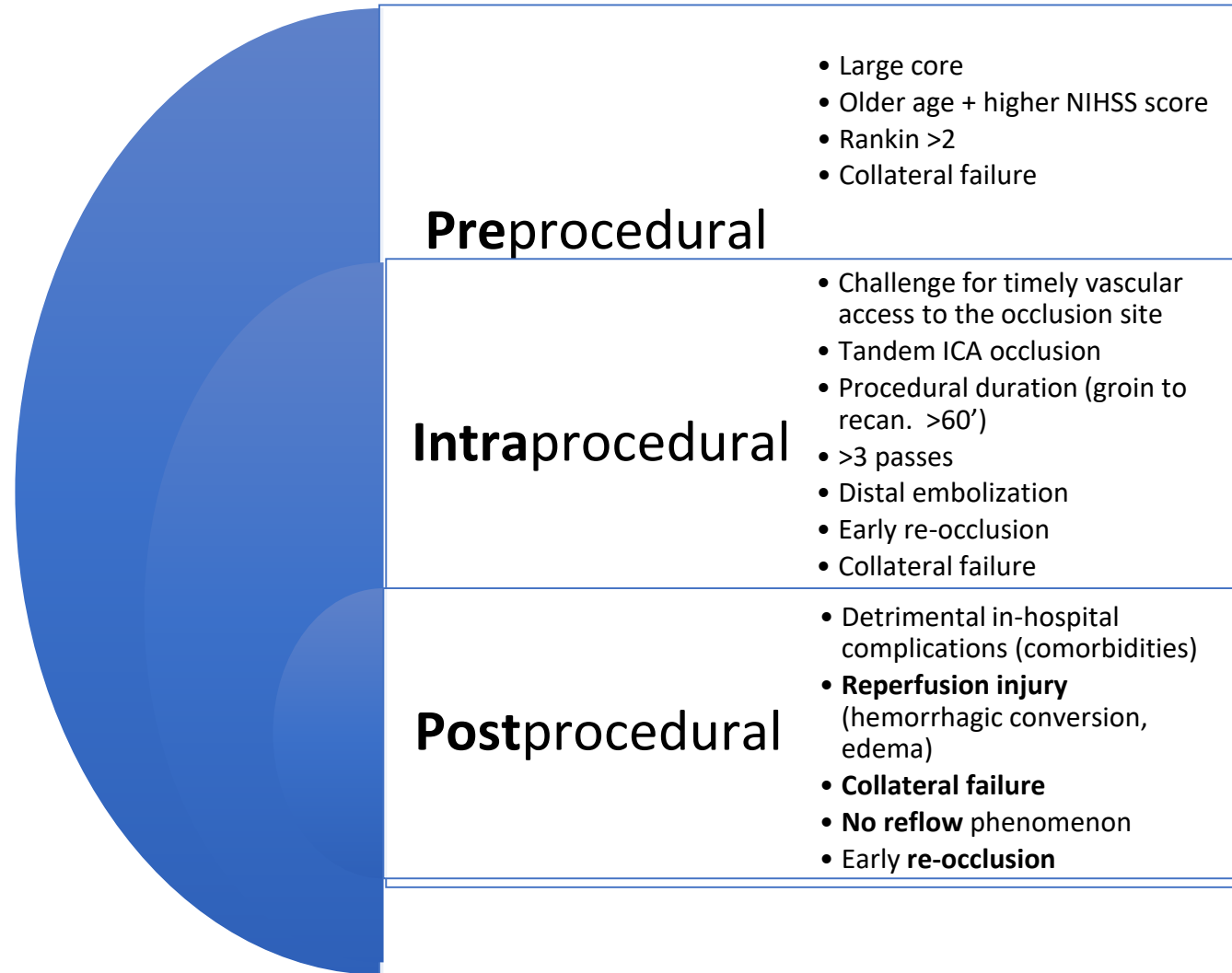
Rationale

Improving outcomes after MT

- New devices and experience = high rates of recanalization
- Clinically Ineffective Reperfusion (CIR): hemorrhagic transformation, brain edema, no-reflow phenomenon, complications,...

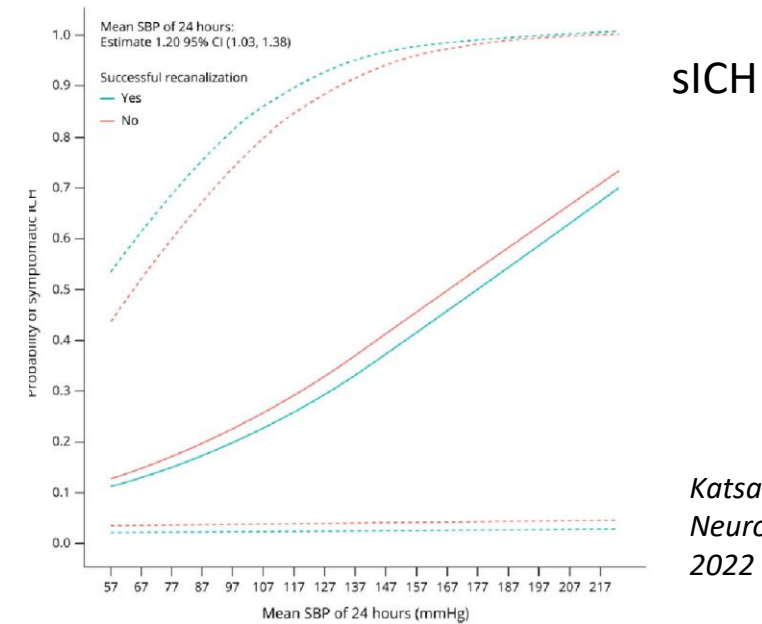
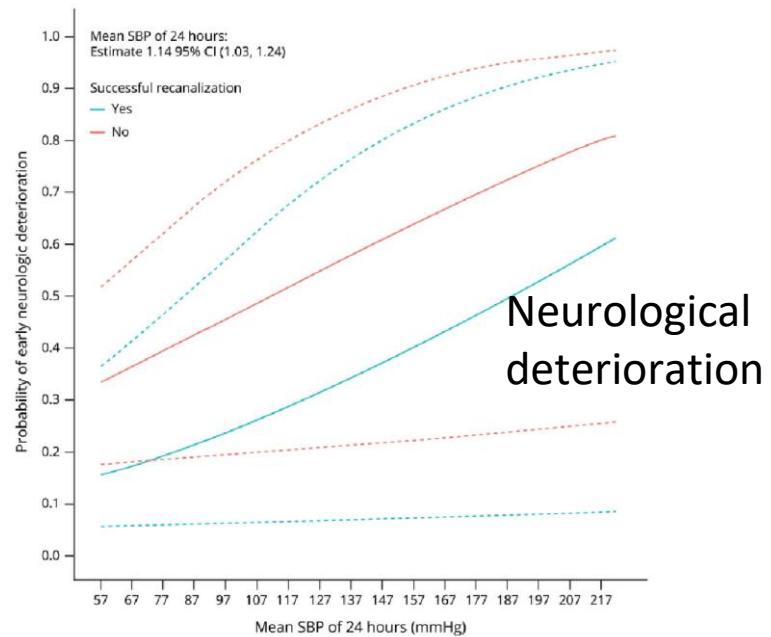
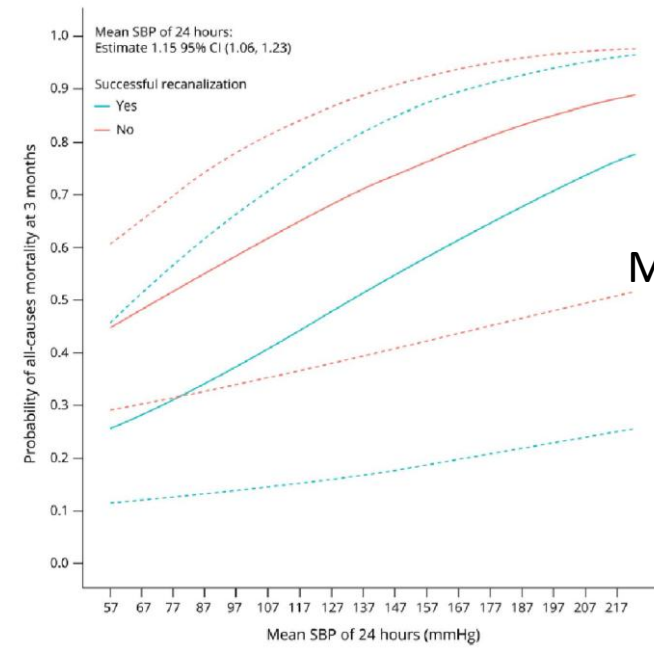
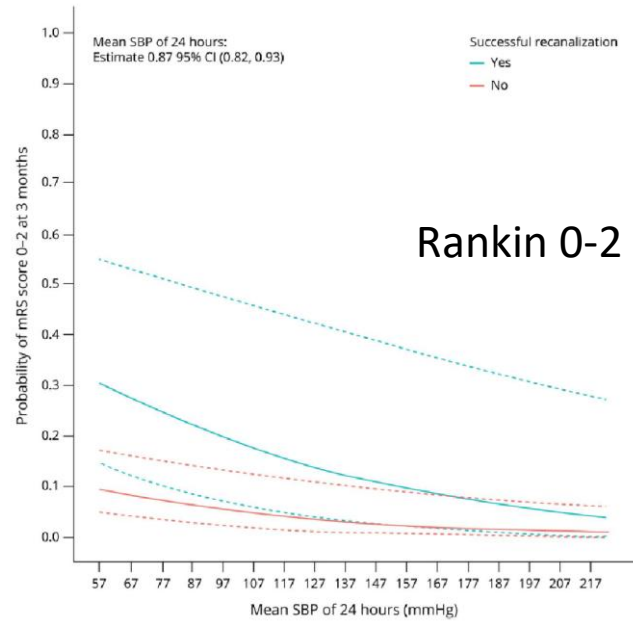


*Clinically
Ineffective
Reperfusion
(20-50%)*

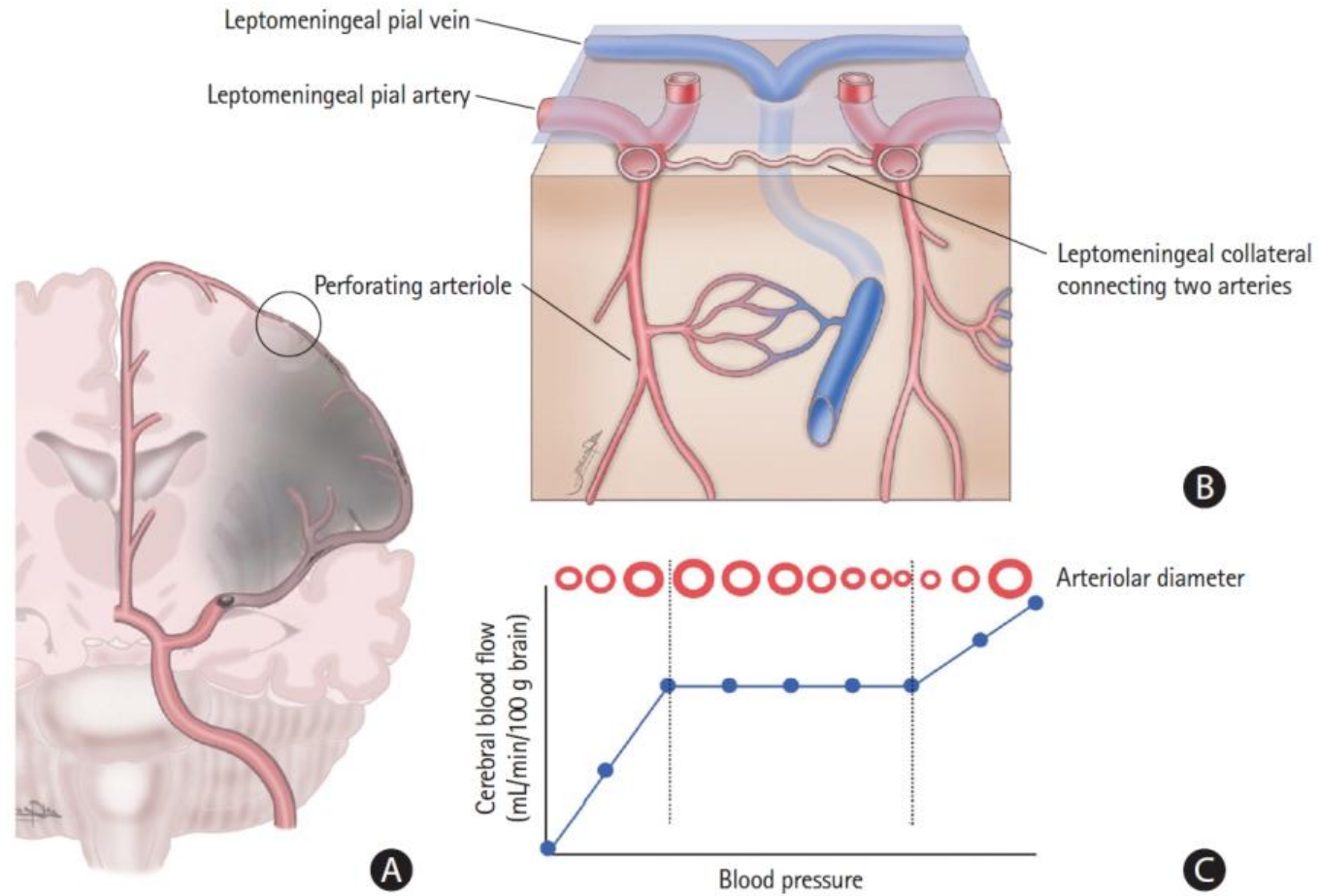


Main research question

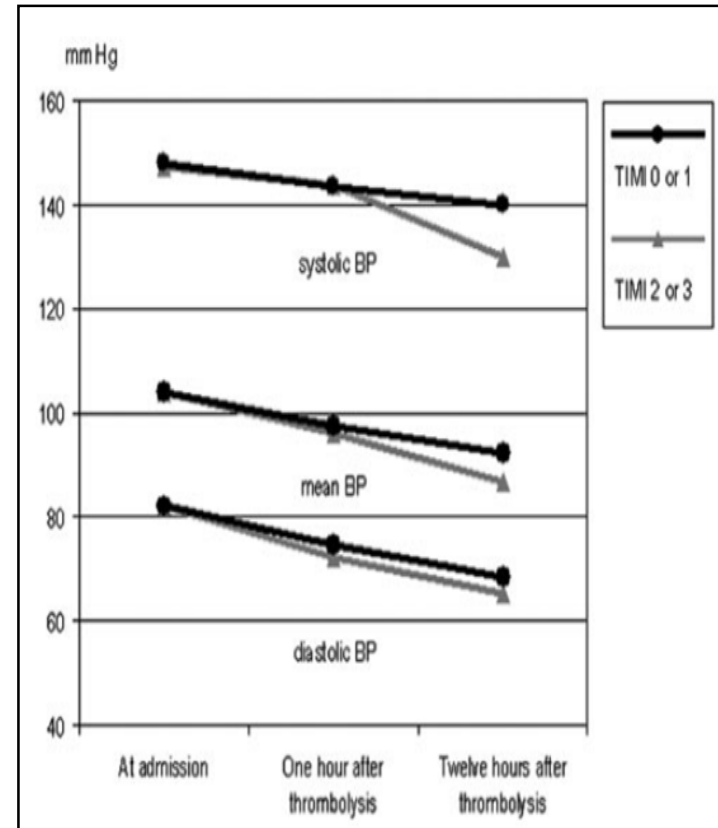
Can we improve outcomes and reduce reperfusion damage, by managing blood pressure after mechanical thrombectomy?



Collateral circulation



BP decreases after successful recanalization. In patients with unsuccessful recanalization, BP decreases as well but at a later time point.



Conclusion—The course of elevated systolic but not diastolic BP after acute ischemic stroke was found to be inversely associated with the degree of vessel recanalization. When recanalization failed, systolic BP remained elevated longer than when it succeeded. (*Stroke*. 2005;36:264-269.)

Blood pressure levels post mechanical thrombectomy and outcomes in large vessel occlusion strokes

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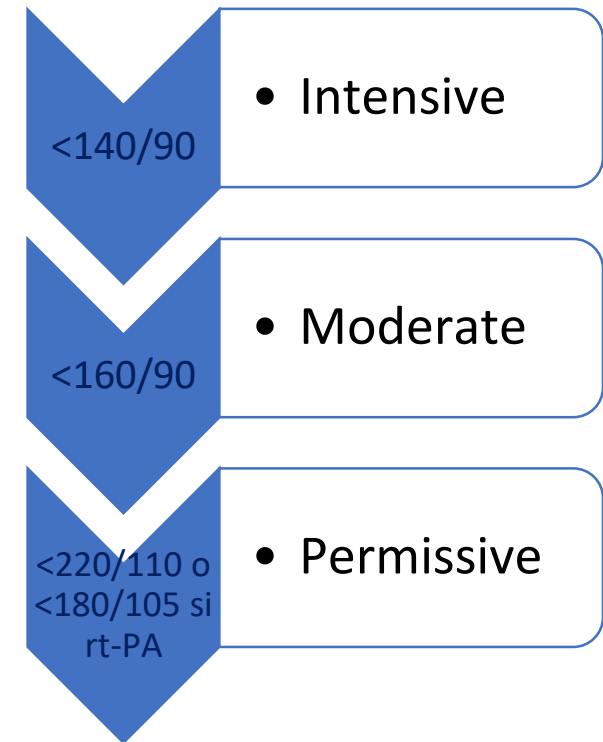
ABSTRACT

Objective: There are limited data evaluating the effect of post mechanical thrombectomy (MT) blood pressure (BP) levels on early outcomes of patients with large vessel occlusions (LVO). We sought to investigate the association of BP course following MT with early outcomes in LVO.

Methods: Consecutive patients with LVO treated with MT during a 3-year period were evaluated. Hourly systolic BP (SBP) and diastolic BP (DBP) values were recorded for 24 hours following MT and maximum SBP and DBP levels were identified. LVO patients with complete reperfusion following MT were stratified in 3 groups based on post-MT achieved BP goals: <140/90 mm Hg (intensive), <160/90 mm Hg (moderate), and <220/110 mm Hg or <180/105 mm Hg when pretreated with IV thrombolysis (permissive hypertension). Three-month functional independence was defined as modified Rankin Scale score of 0-2.

Results: A total of 217 acute ischemic stroke patients with LVO were prospectively evaluated. A 10 mm Hg increment in maximum SBP documented during the first 24 hours post MT was independently ($p = 0.001$) associated with a lower likelihood of 3-month functional independence (odds ratio [OR] 0.70; 95% confidence interval [CI] 0.56-0.87) and a higher odds of 3-month mortality (OR 1.49; 95% CI 1.18-1.88) after adjusting for potential confounders. In addition, achieving a BP goal of <160/90 mm Hg during the first 24 hours following MT was independently associated with a lower likelihood of 3-month mortality (OR 0.08; 95% CI 0.01-0.54; $p = 0.010$) in comparison to permissive hypertension.

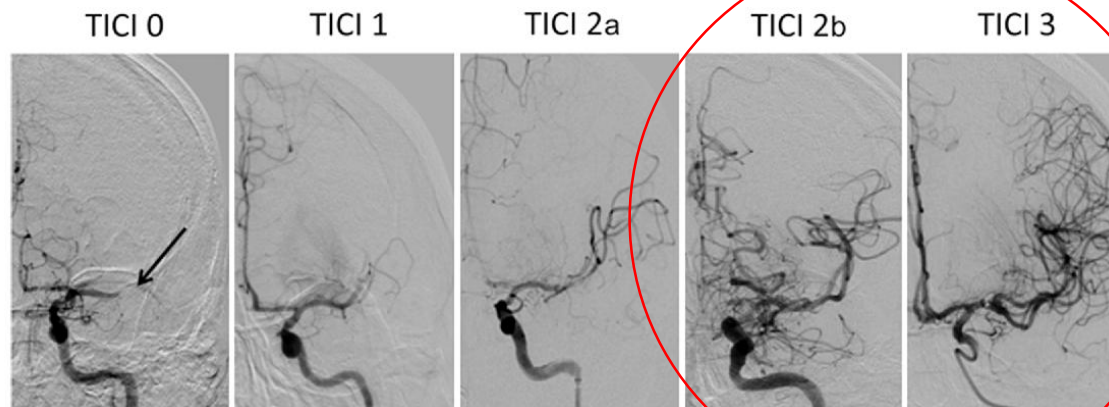
Conclusions: High maximum SBP levels following MT are independently associated with increased likelihood of 3-month mortality and functional dependence in LVO patients. Moderate BP control is also related to lower odds of 3-month mortality in comparison to permissive hypertension. *Neurology*® 2017;89:1-8



Main research question

Can we improve outcomes and reduce reperfusion damage, ~~by managing blood pressure after mechanical thrombectomy?~~

...by tailoring BP according to the degree of final recanalization after MT?



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perfusion after stroke

Methods

A Randomized Trial on Hemodynamic Optimization of Cerebral Perfusion after Successful Endovascular Therapy in Patients with Acute Ischemic Stroke (HOPE)

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Xavier Ustrell^e Nicolás López-Hernández^f Diego José Corona-García^f
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Mar Castellanos^l Laura Albert-Lacal^m Ainara Sanz-Monllor^m
Ana Aguilera-Simón^a Rebeca Marín^a Garbiñe Ezcurra-Díaz^a
Álvaro Lambea-Gil^a Joan Martí-Fàbregas^a

Minimum difference to detect
between groups=10%

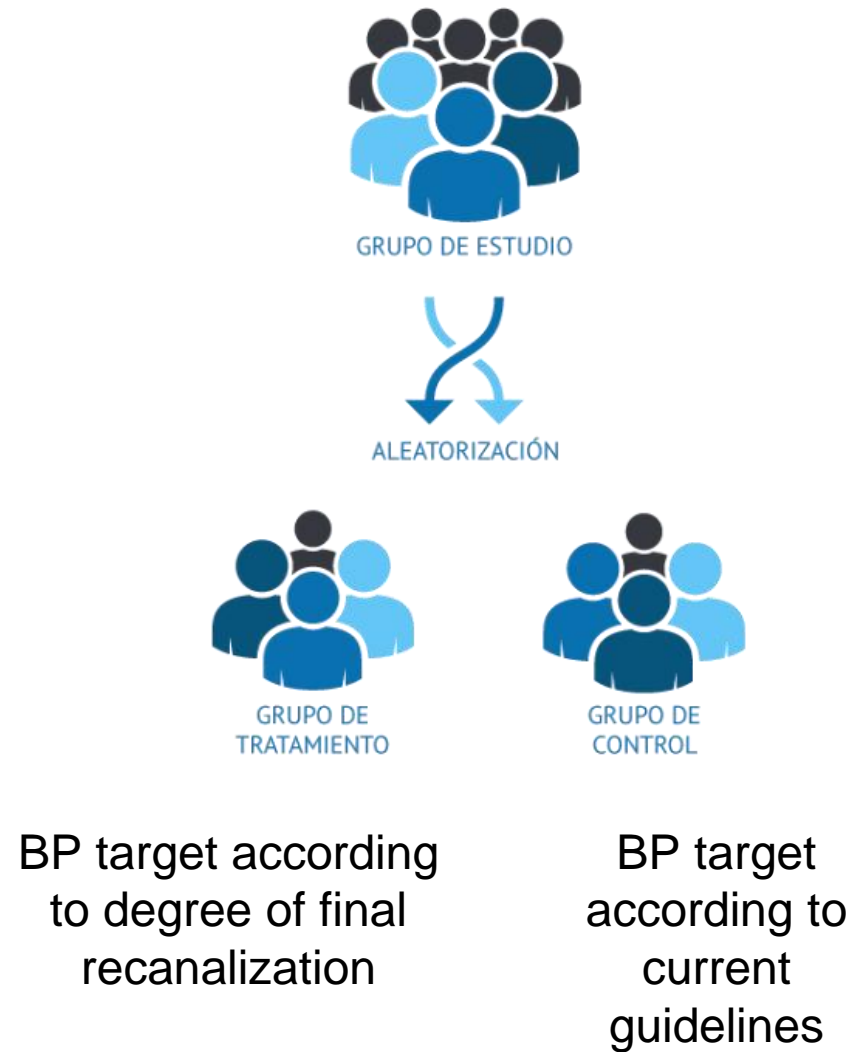
Minimum power=80%

n=814 patients

HOPE

Improving cerebral
perfusion after stroke

Intervention (0-72h)

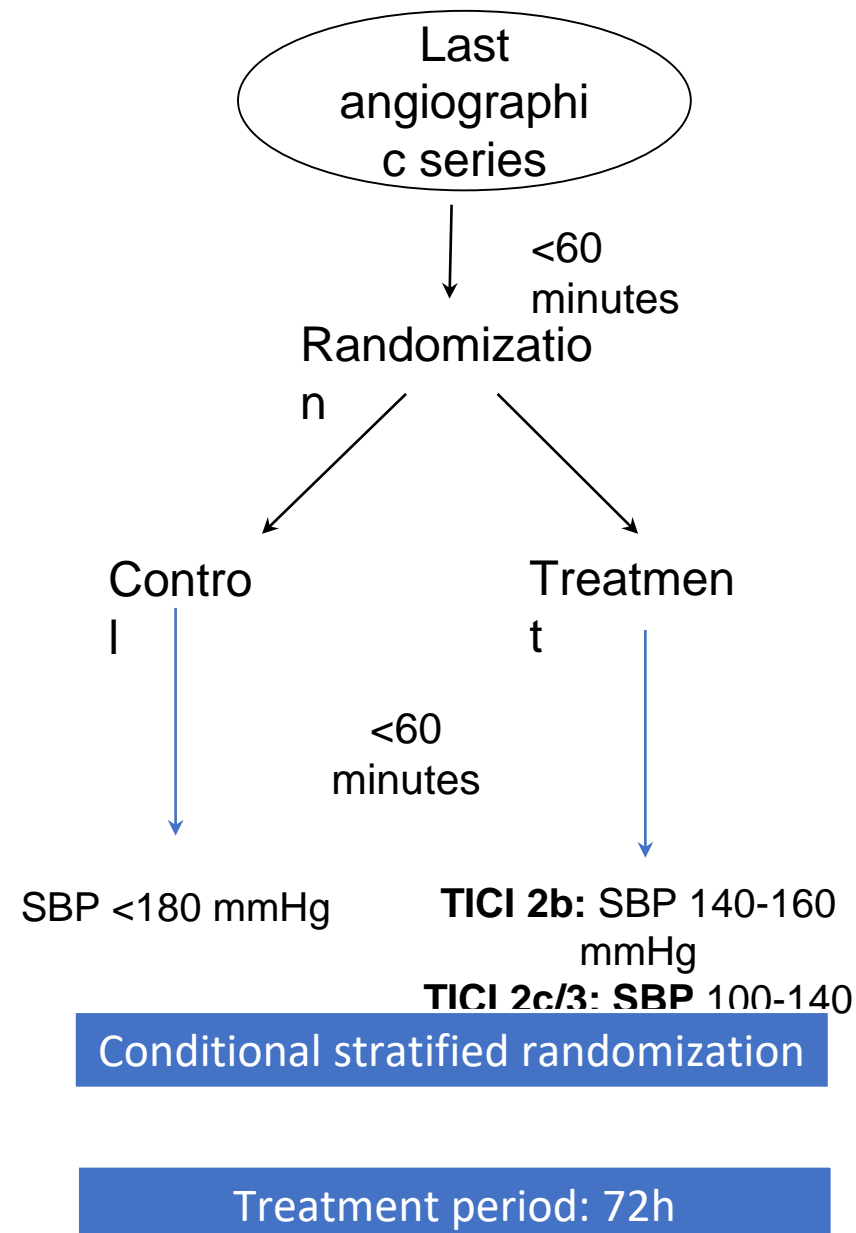


Inclusion Criteria

1. Anterior circulation AIS within 24 h of symptom onset.
2. Final mTICI score $\geq 2b$.
3. Prior mRS score < 3 .
4. Informed consent

Criterios de Exclusión

1. ASPECTS < 6 .
2. VA, BA, A2, P1-2, or M3-4 occlusions.
3. History of ICH
4. Pregnancy
5. Unstable or recent (< 3 months) coronary artery disease or congestive heart failure
6. Artery dissection/arterio-venous malformation.
7. History of ventricular arrhythmias
8. Use of monoamine oxidase inhibitors



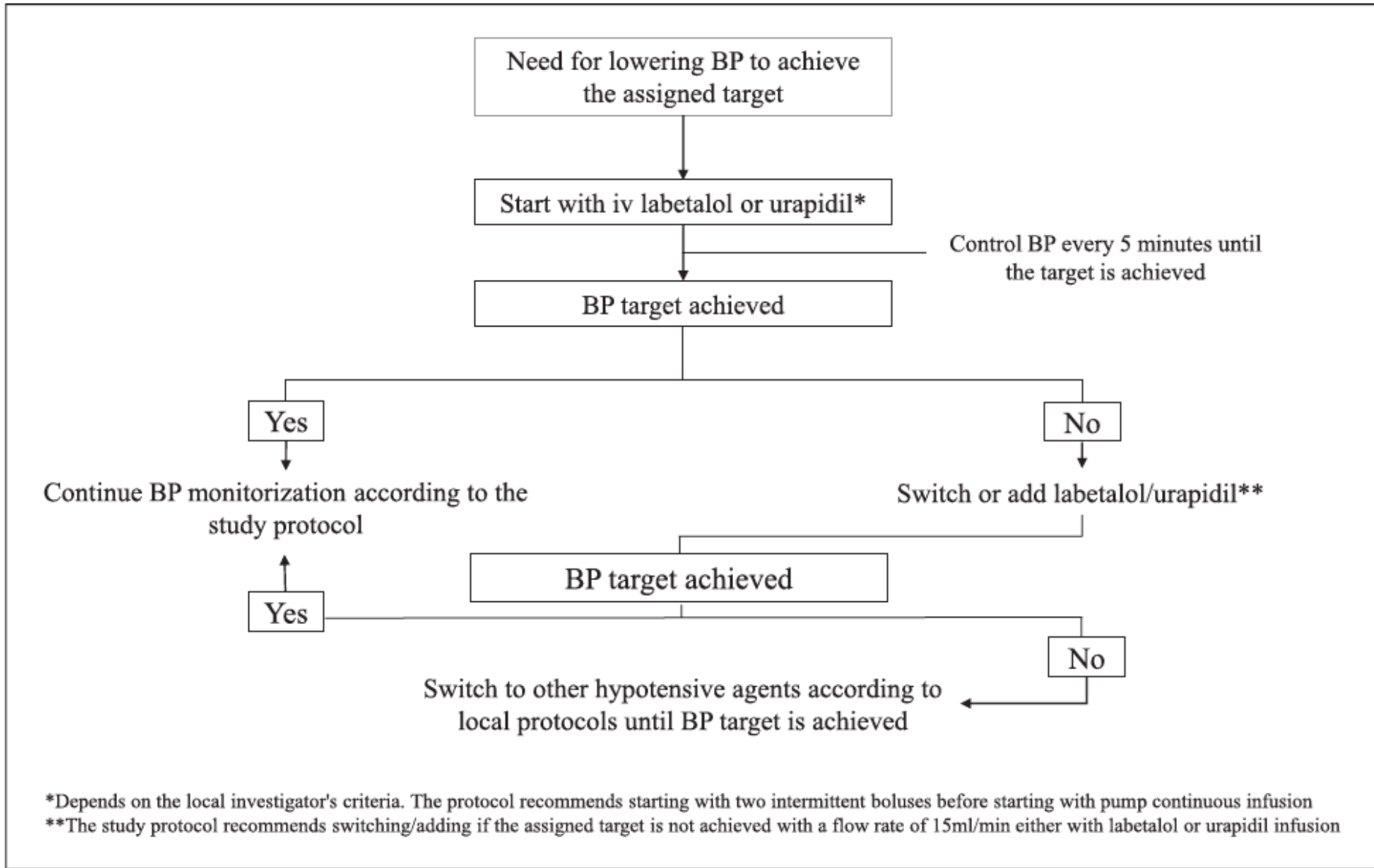


Fig. 2. Study protocol for lowering BP.

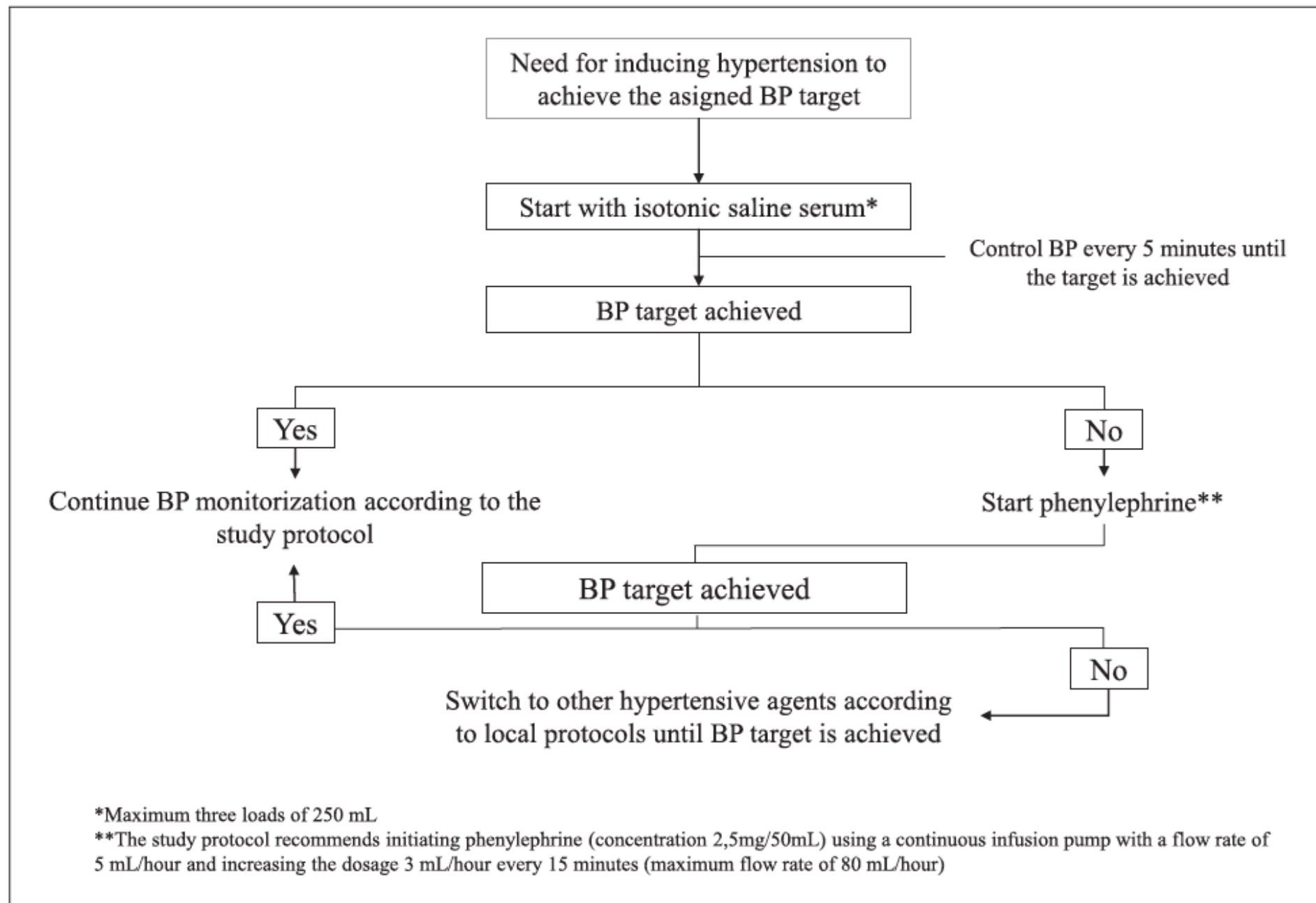


Fig. 3. Study protocol for vasopressor therapy.

STOP PROTOCOL if:

- Hemodynamic instability
 - Reocclusion or
recurrence
 - sICH or PH2

HUPE Improving cerebral
perfusion after stroke

Outcomes

HOPE

Improving cerebral
perfusion after stroke

Primary efficacy outcome:

Score on the mRS at 90 days

Secondary efficacy outcome:

Shift on the mRS score at 90 days

Blinded evaluation

Safety outcomes:

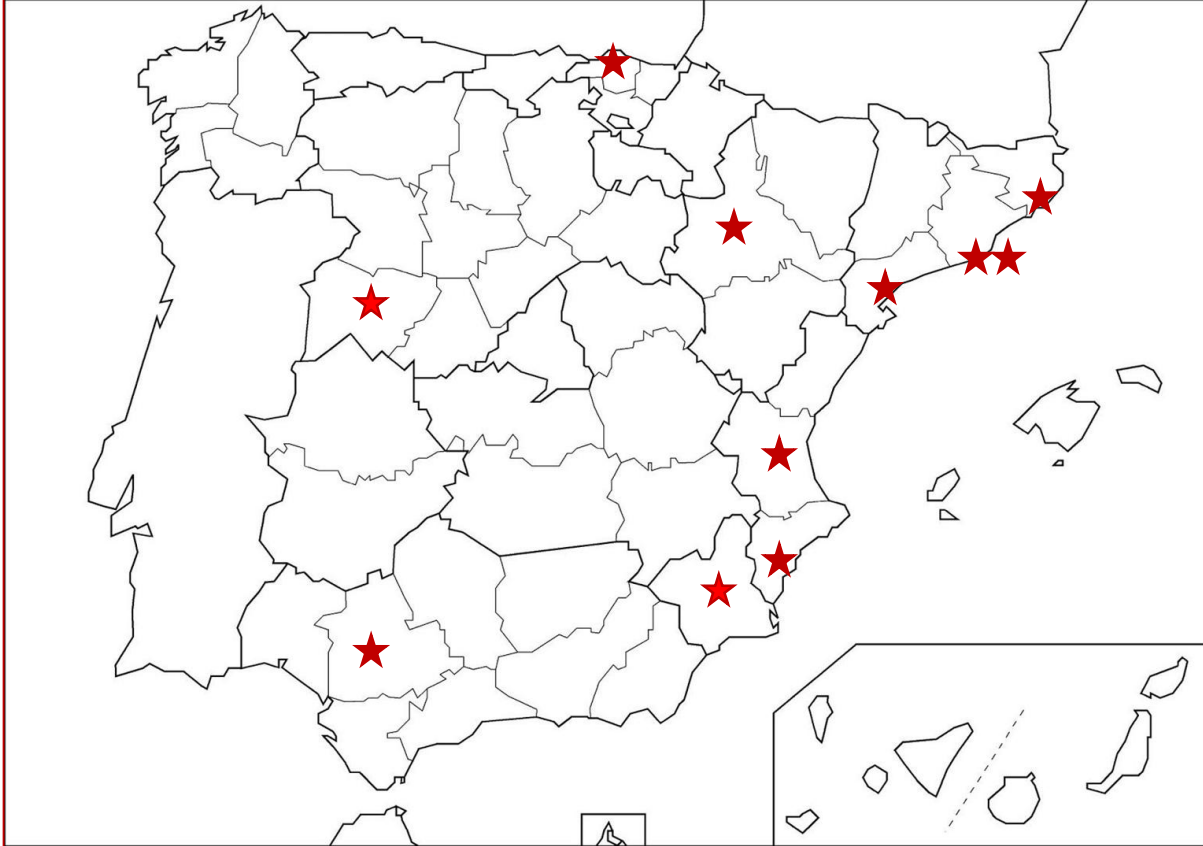
sICH or PH2

Neurological deterioration

Death

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perfusion after stroke

Current status



12 Participating Centers:

- Hospital de la Santa Creu i Sant Pau (Barcelona)
- Hospital del Mar (Barcelona)
- Hospital Josep Trueta (Girona)
- Hospital Virgen del Rocío (Sevilla)
- Hospital Cruces (Barakaldo)
- Hospital La Fe (Valencia)
- Hospital Clínico de Valencia (Valencia)
- Joan XXIII (Tarragona)
- H Universitario Alicante (Alicante)
- H Miguel Servet (Zaragoza)
- H Virgen de la Arrixaca (Murcia)
- Hospital de Salamanca (Salamanca)

Interim analyses

Enchanted2
Enhanced Control of Hypertension
and Thrombectomy Stroke Study

Unplanned analysis, n=87
February-March 2023



Planned analysis, n=500
June 2025

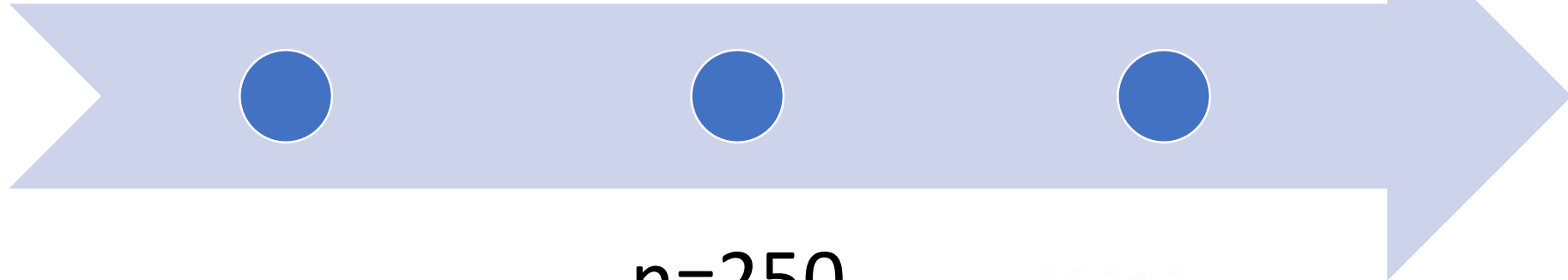
n= 500



?

n=250

Planned analysis, n=250
June 2024



2 important points can be drawn from the interim analysis with 259 patients:



Summary of trials of BP management after EVT

Trial	n	BP objective	Treatment duration	End point	Results
BP-TARGET	324	I: 100-129 C: 130-185	24h	ICH 24-36h	Neutral
ENCHANTED2/MT	821	I: <120 C: 140-180	72h	mRS 3m shift	Worse results in the intensive group
OPTIMAL-BP	302	I: <140 C: 140-180	24h	mRS 0-2 vs 3-6	Worse results in the intensive group
BEST-II	233	<140 / <160 / ≤180	24h	Infarct volume 36h	Not futility, low probability of favourable effect
HOPE	814	TICI 2b: 140-160 TICI 2c/3: 100-140 C: <180 BP lowering agents and vasopressors	72h	mRS 0-2 vs 3-6	?

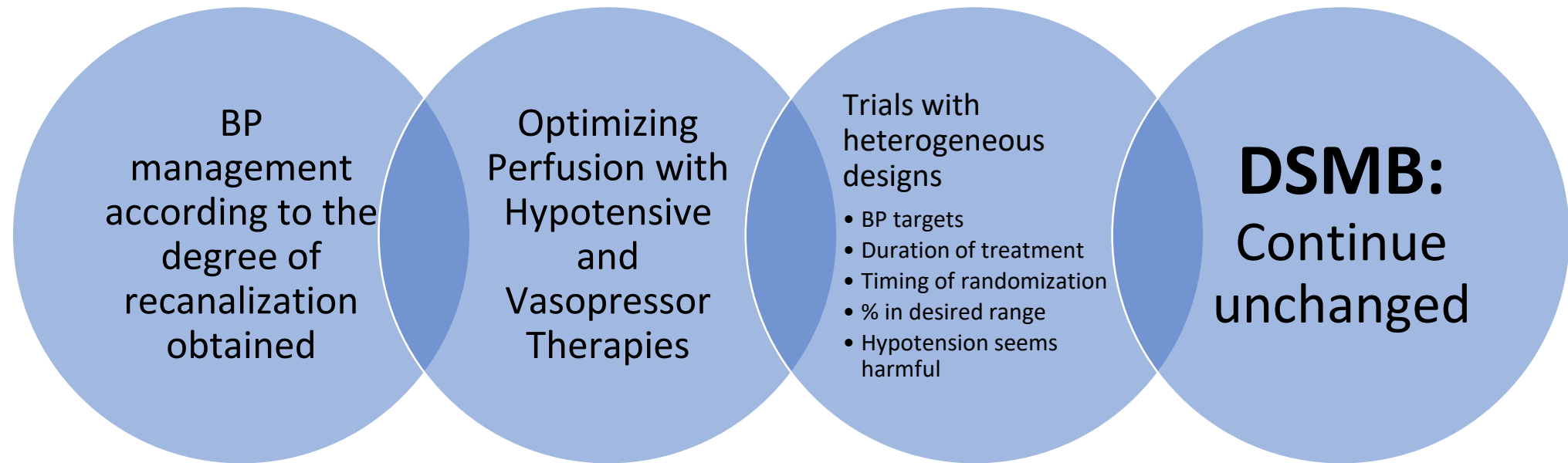
Clinical guidelines

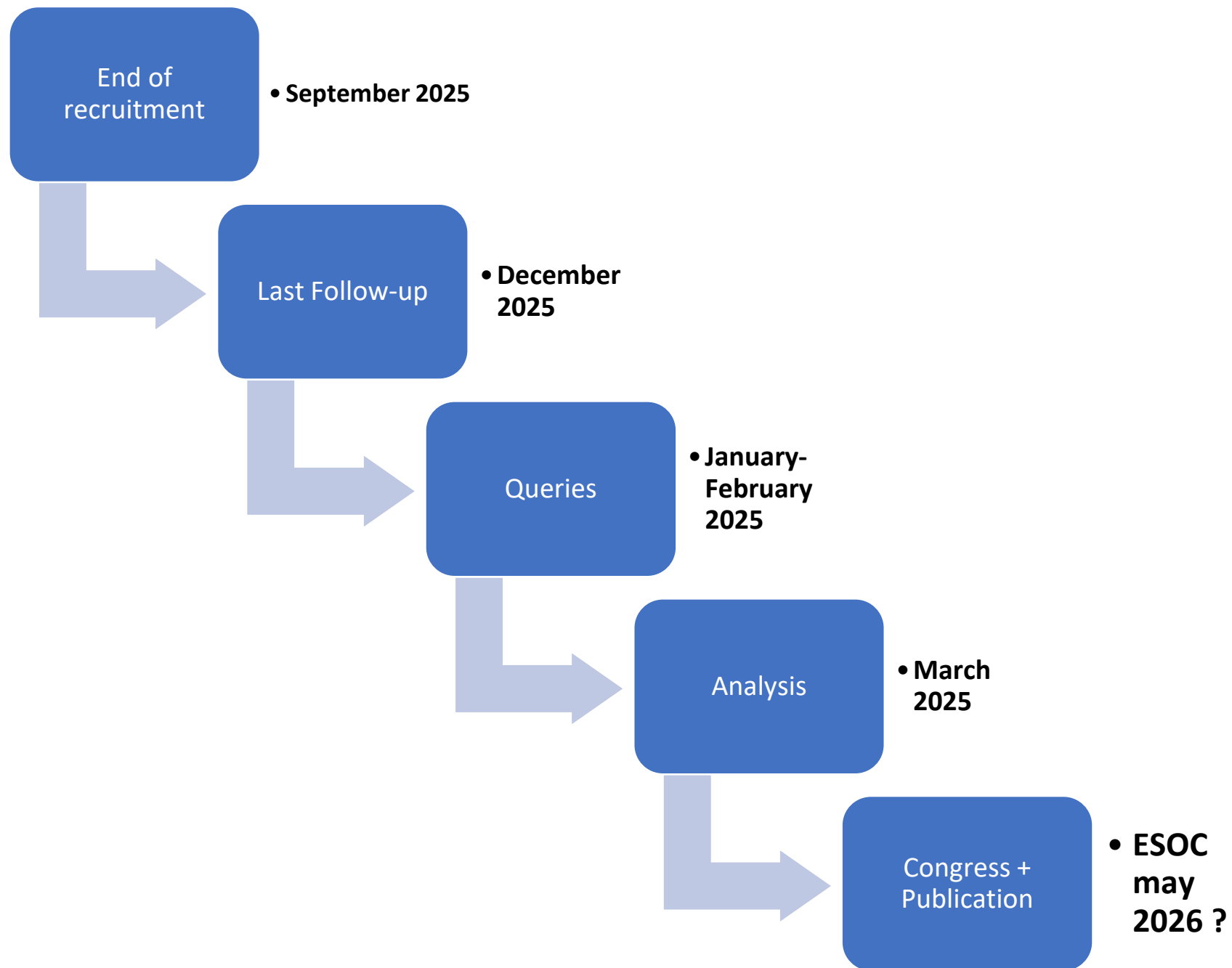
Maintain BP
< 185/105mmHg

Avoid SBP drops
< 130mmHg.

HOPE trial

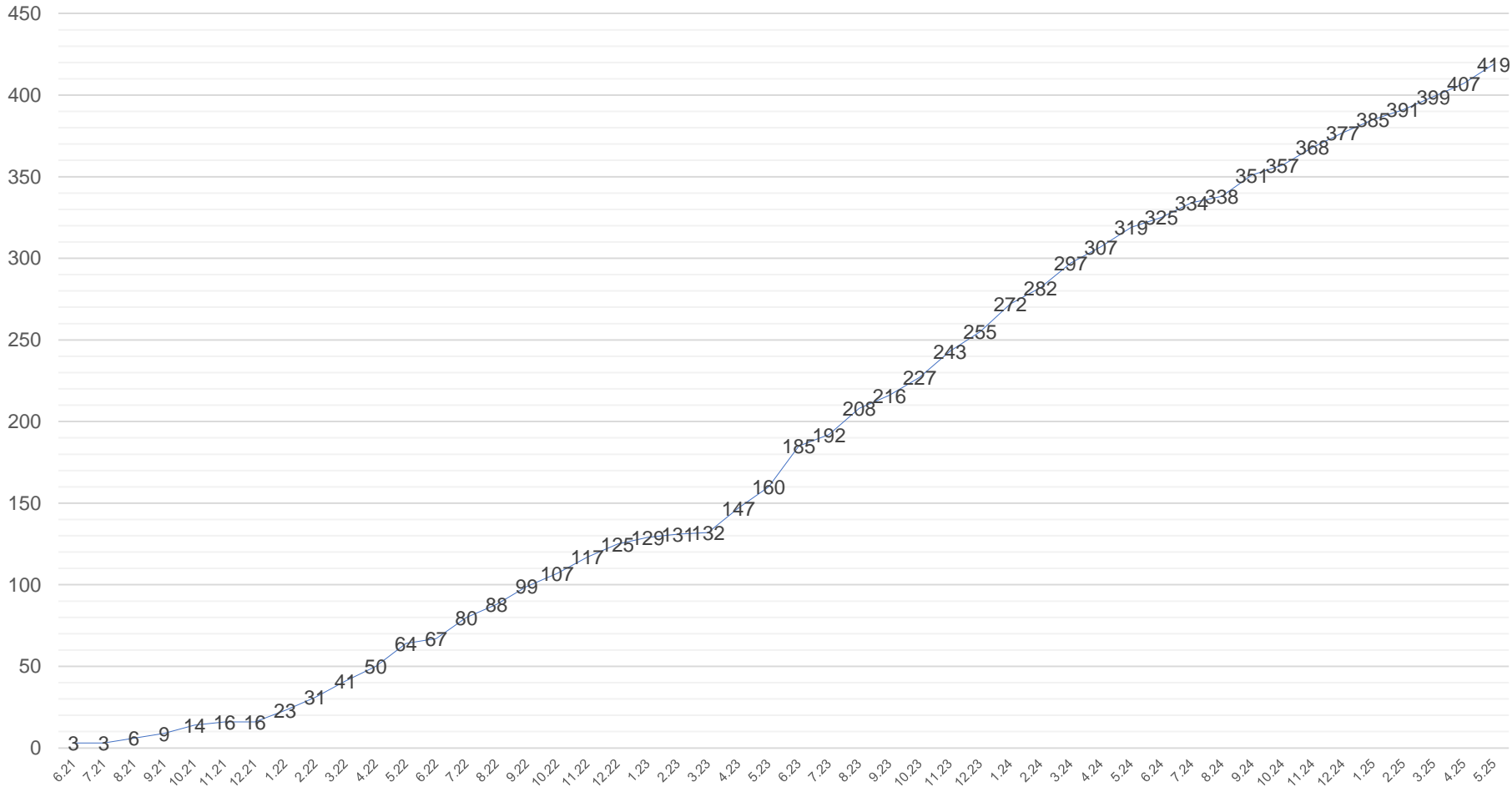
Is still necessary?

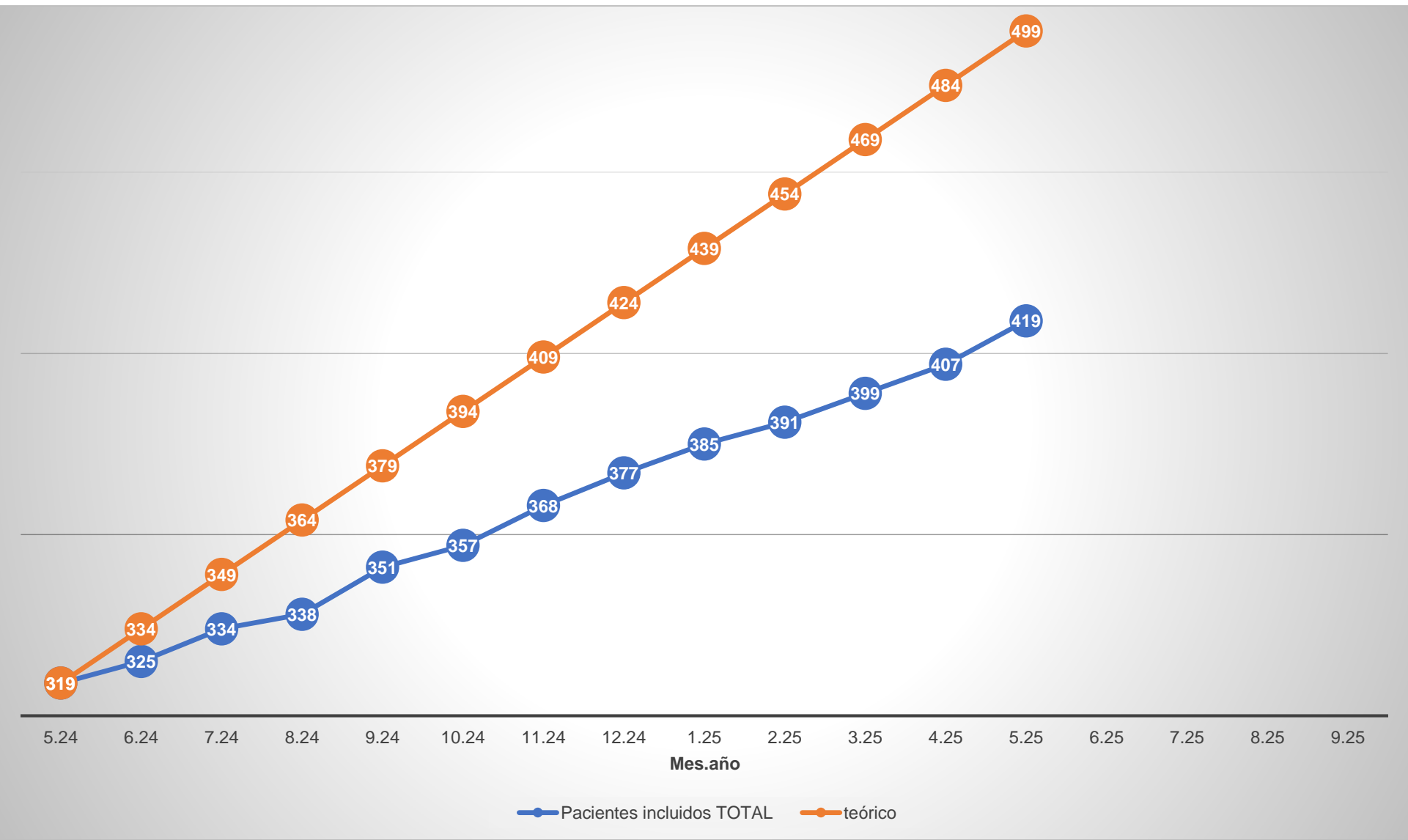




Pacientes incluidos TOTAL

Pacientes incluidos TOTAL





Gracias por la atención!

