

Ablação arteria renal

Principais estudos

O que é?

Electrode tipped catheter

Tip of electrode



Radiofrequency generator



Temperature

Impedance, %

RF energy (watts)

Em quem aplicar?

The diagram is a flowchart with four main steps in colored boxes: black, red, yellow, and green. A large blue arrow points from left to right behind these boxes. Below the first three steps are three white boxes with black outlines, each containing specific criteria or conditions related to the step above it.

Identificar
a HAS
resistente

Tratar as
causas
secundárias

Determinar
os
candidatos
a
denervação

Realizar a
denervação
renal e
fazer
follow-up

**PA acima da
meta**

- Excluir HAS do avental branco
- 3 ou mais agentes antihipertensivos
- 1 agente diurético

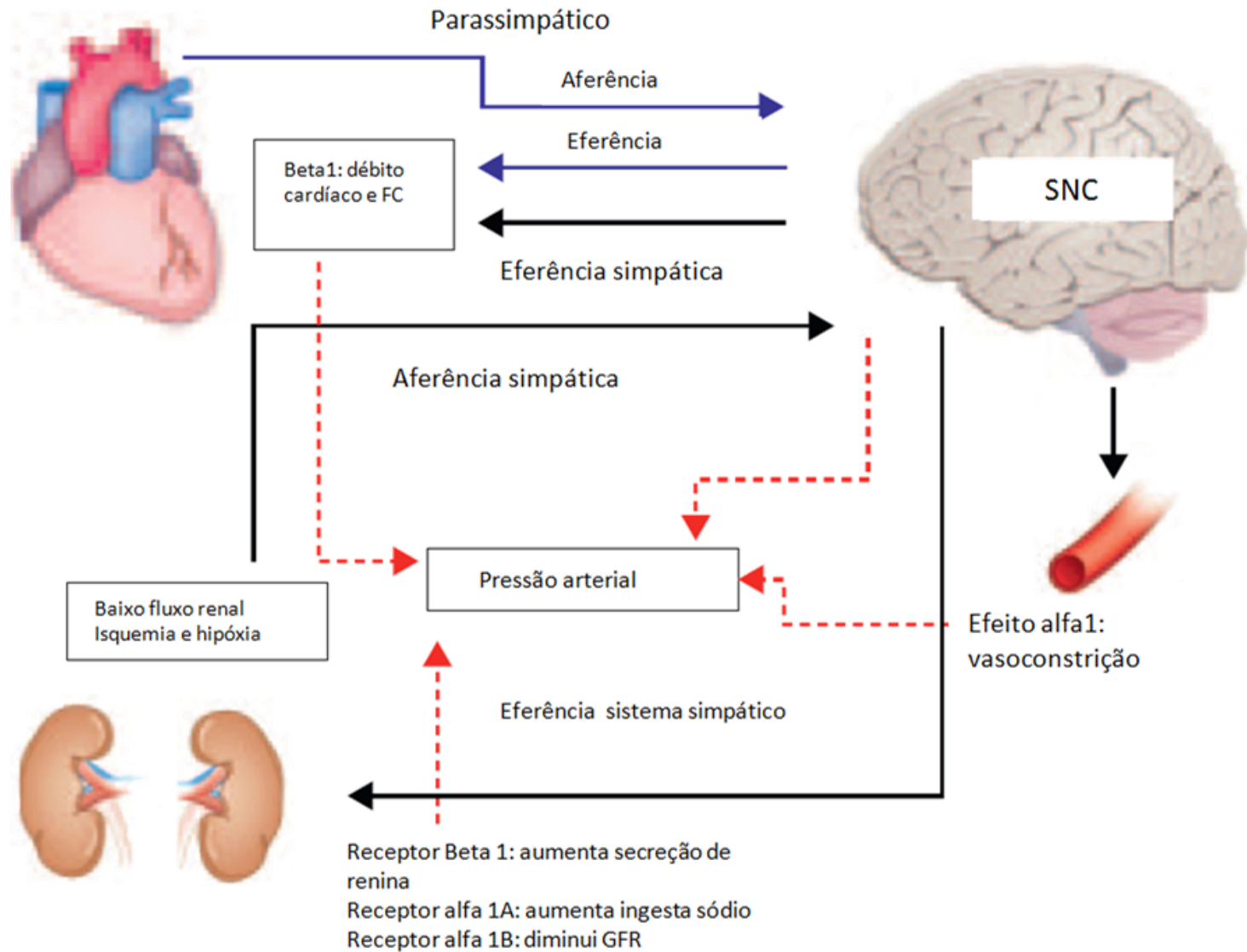
Condições

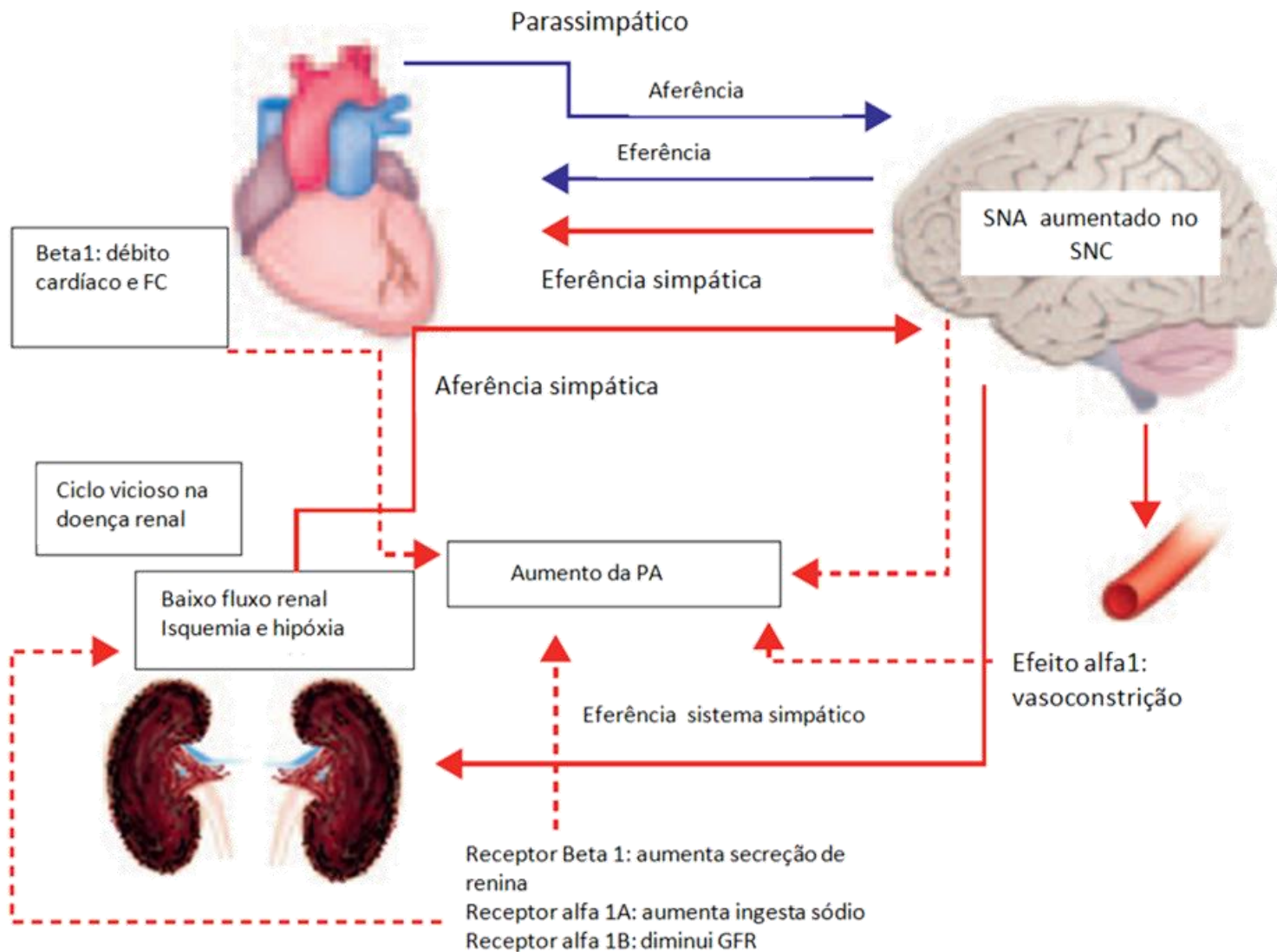
- Apnéia do sono
- Hiperaldosteronismo
- Doença crônica renal
- Estenose de artéria renal
- Medicamentos e substâncias

Função renal

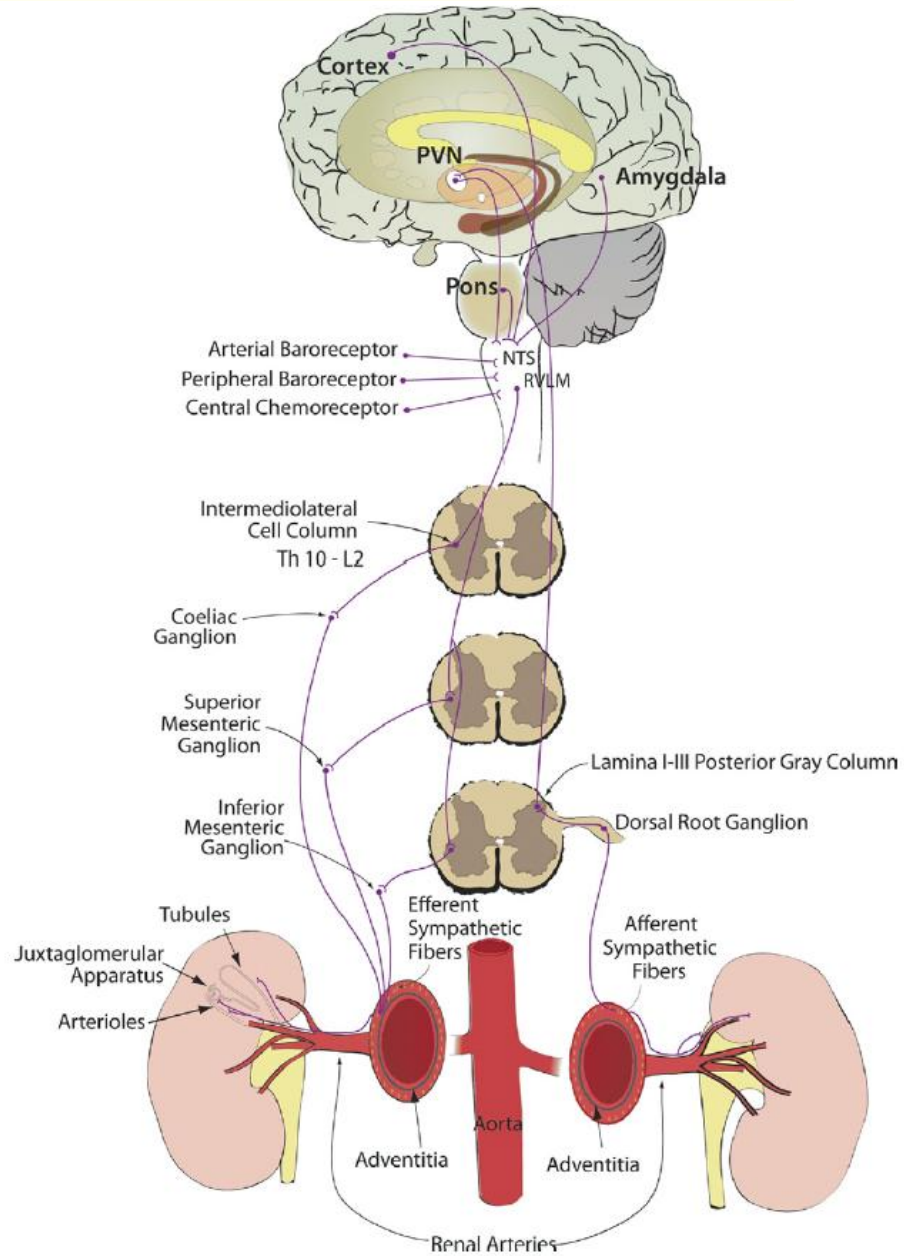
- Anatomia da artéria renal
- Comorbidades

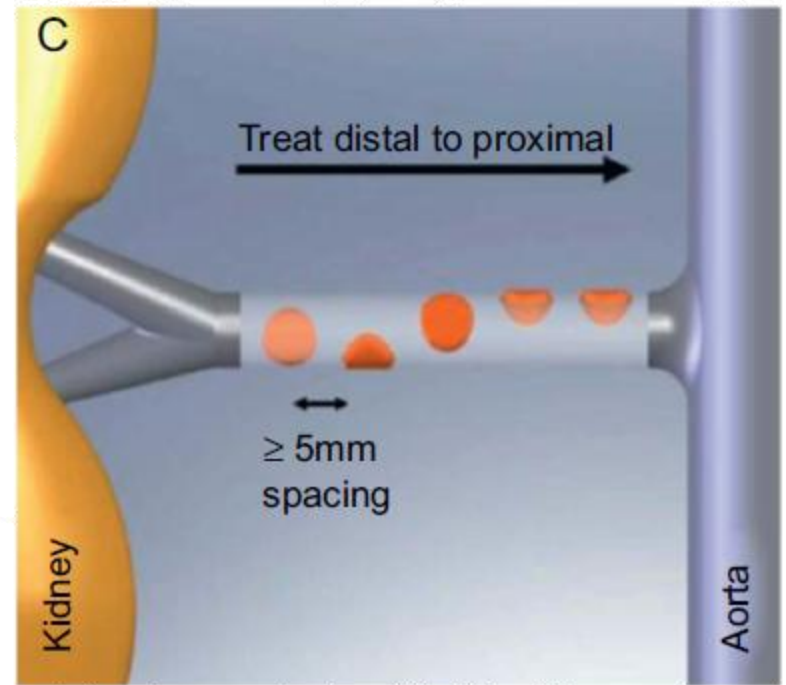
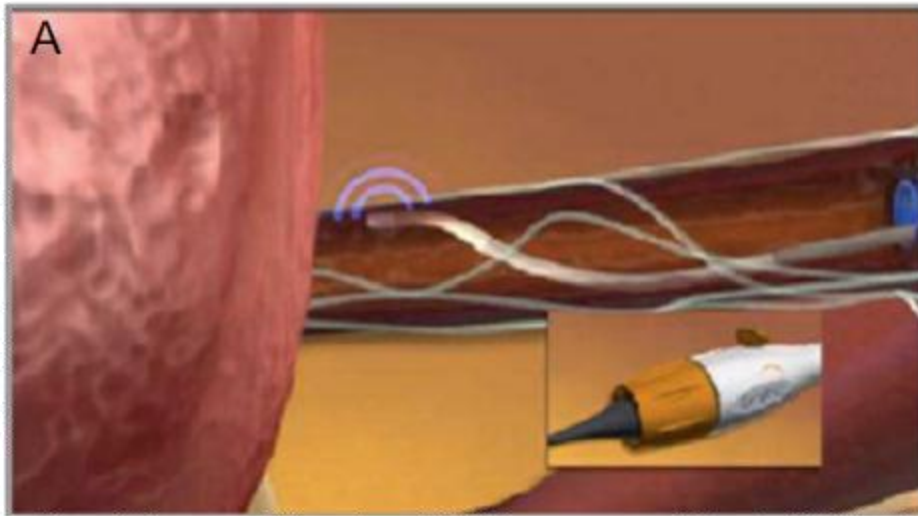
Qual o motivo?



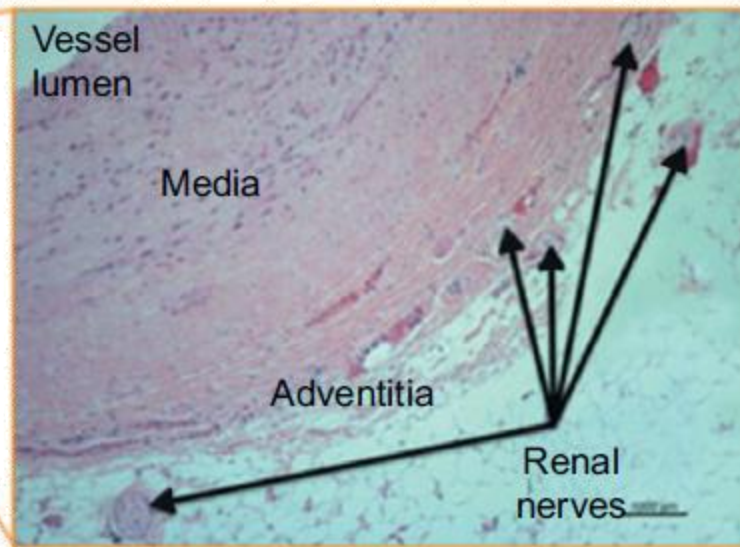


NTS = solitary tract nucleus; PVN = paraventricular nucleus; RVLM = rostral ventrolateral medulla.





B

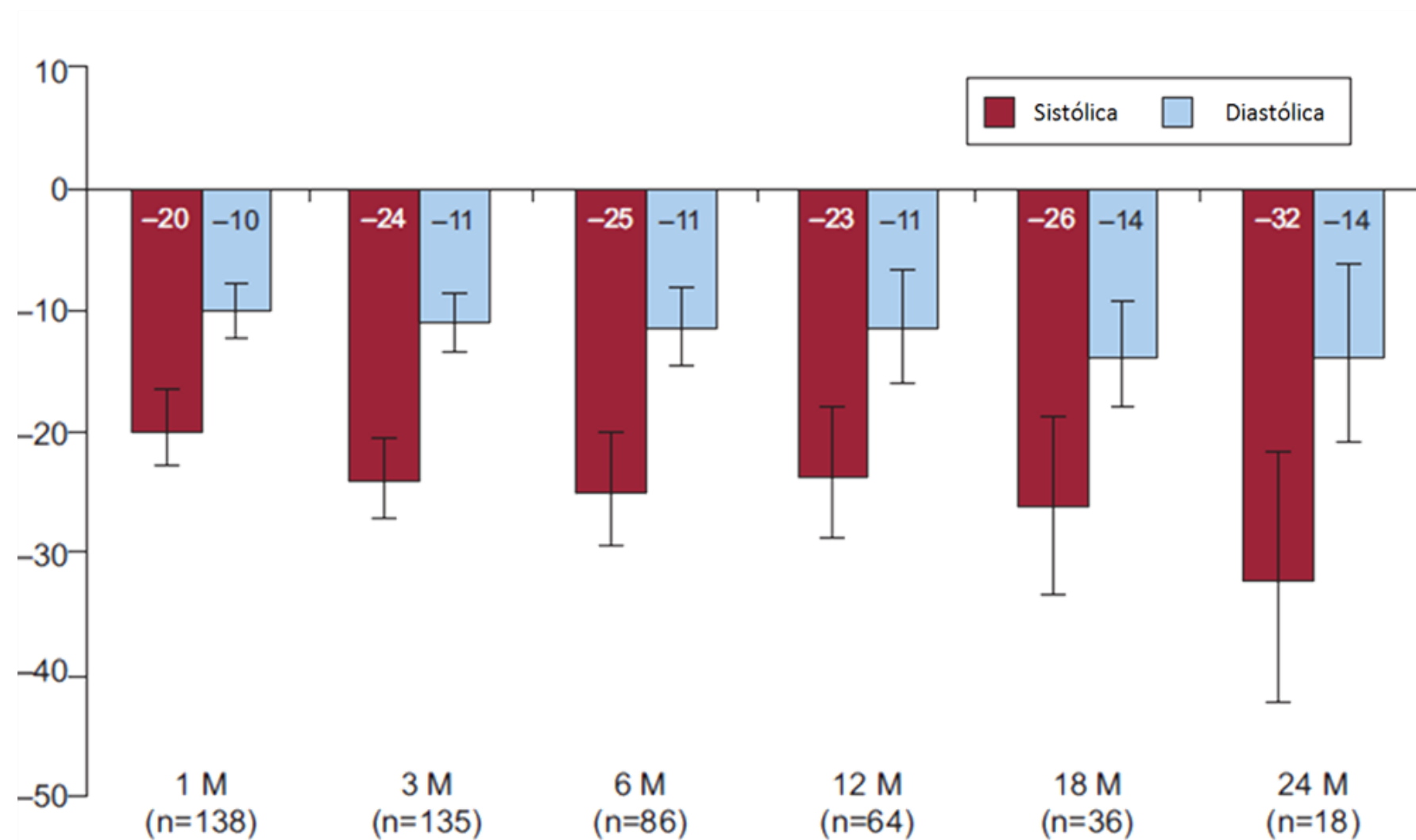


Desde quando?

Study	Krum et al. ⁶	Symplcity HTN-1 ⁸	Symplcity HTN-2 ⁹
	First-in-man	Multicenter, open-label, no control, June 2007-May 2010	Multicenter, open-label, randomized, June 2009-January 2010
	Phase 1 study, June 2007-November 2008		
<i>Patients, no.</i>	50	153	106 (RND, 52; control, 54)
<i>Age, years</i>	58±9	57±11	58±12
<i>Antihypertensive medications</i>	4.7±1.4	5.1±1.4	RND 5.2±1.5 (n=52); control 5.3±1.8 (n=51)
<i>Class at baseline</i>			
ACE inhibitors/ARB	96	91	95
β-blockers	76	82	75
CCB	69	75	81
Diuretic	96	95	89
Estimate GFR, mL/min/1.73 m ²	81±23	83±20	RND 77±19 (n=52); control 86±20 (n=54)
BP at baseline, mmHg	177±20/101±15 (n=50)	176±17/98±14 (n=153)	RND 178±18/96±16 (n=52); control 178±17/97±16 (n=54)
BP at 6 months, mmHg	155±10 ^a /90±5 ^a (n=26)	151 ^a /87 ^a (n=86)	RND 146±23 ^{a,c} /84±11 ^{a,c} (n=49); control 179±21/97±10 (n=51)
BP at 12 months, mmHg	155±16 ^a /90±11 ^b (n=9)	153 ^a /87 ^a (n=64)	RND 150±24.9 ^a /86.3±10.6 ^a (n=49); control NA (crossed over in 6 months)

**Grande parte dos estudos mostra redução da
PA no consultório havendo discrepâncias
quando se utiliza o MAPA**

Padrão de redução da PA ao longo do tempo



Desnervação renal em doentes com hipertensão arterial resistente: resultados aos seis meses de seguimento

Hélder Dorés^{a,*}, Manuel de Sousa Almeida^{a,d}, Pedro de Araújo Gonçalves^{a,d}, Patrícia Branco^b, Augusta Gaspar^b, Henrique Sousa^b, Angela Canha Gomes^c, Maria João Andrade^a, Maria Salomé Carvalho^a, Rui Campante Teles^{a,d}, Luís Raposo^{a,d}, Henrique Mesquita Gabriel^{a,d}, Francisco Pereira Machado^d, Miguel Mendes^a

^a Serviço de Cardiologia, Hospital de Santa Cruz, CHLO, Lisboa, Portugal

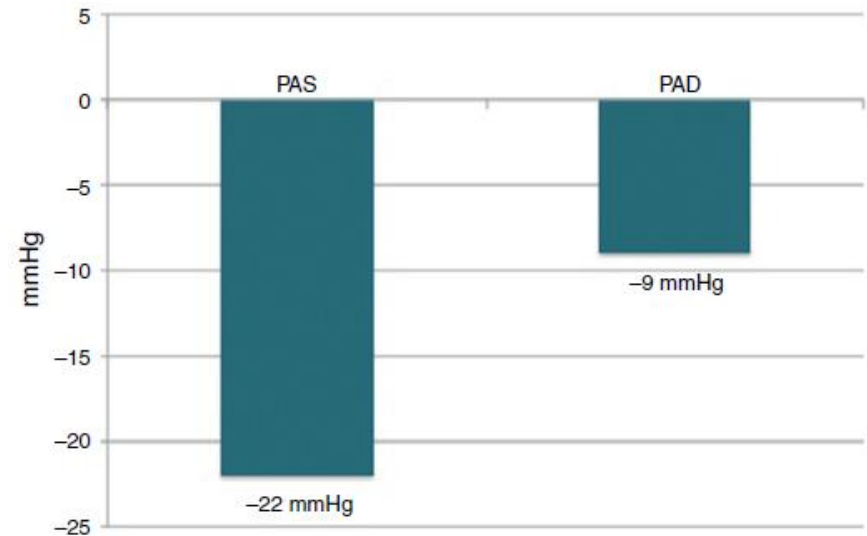
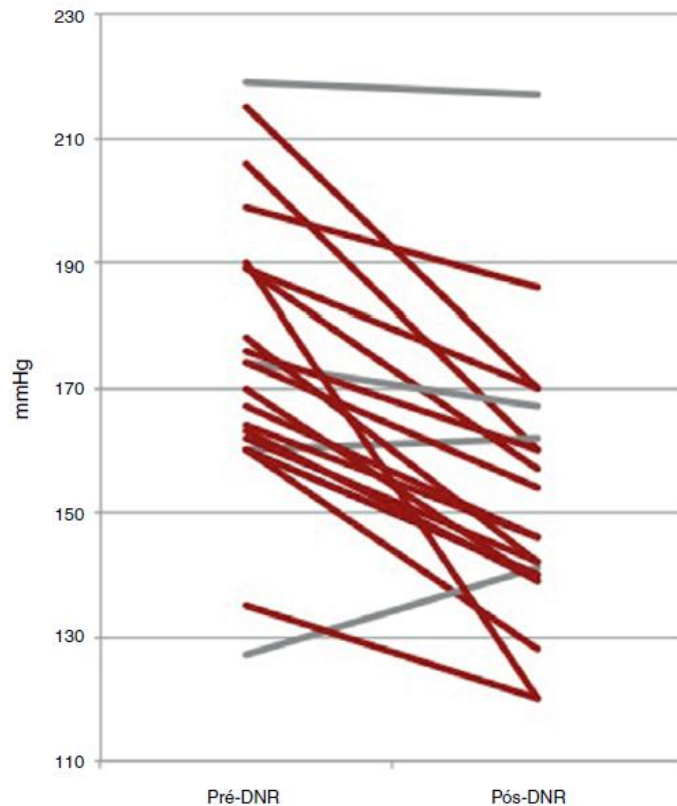
^b Serviço de Nefrologia, Hospital de Santa Cruz, CHLO, Lisboa, Portugal

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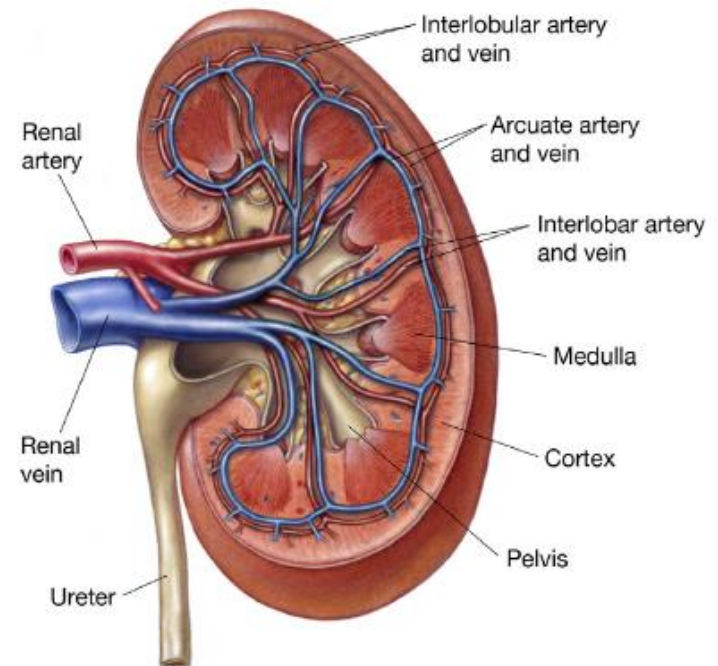
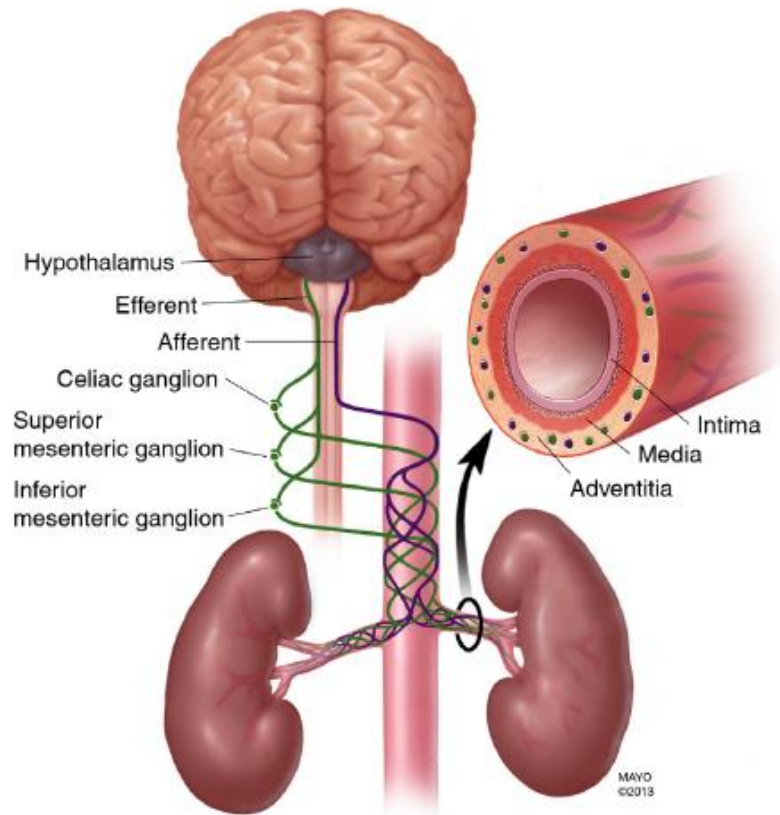
Doentes avaliados em consulta de HTA resistente
N = 177

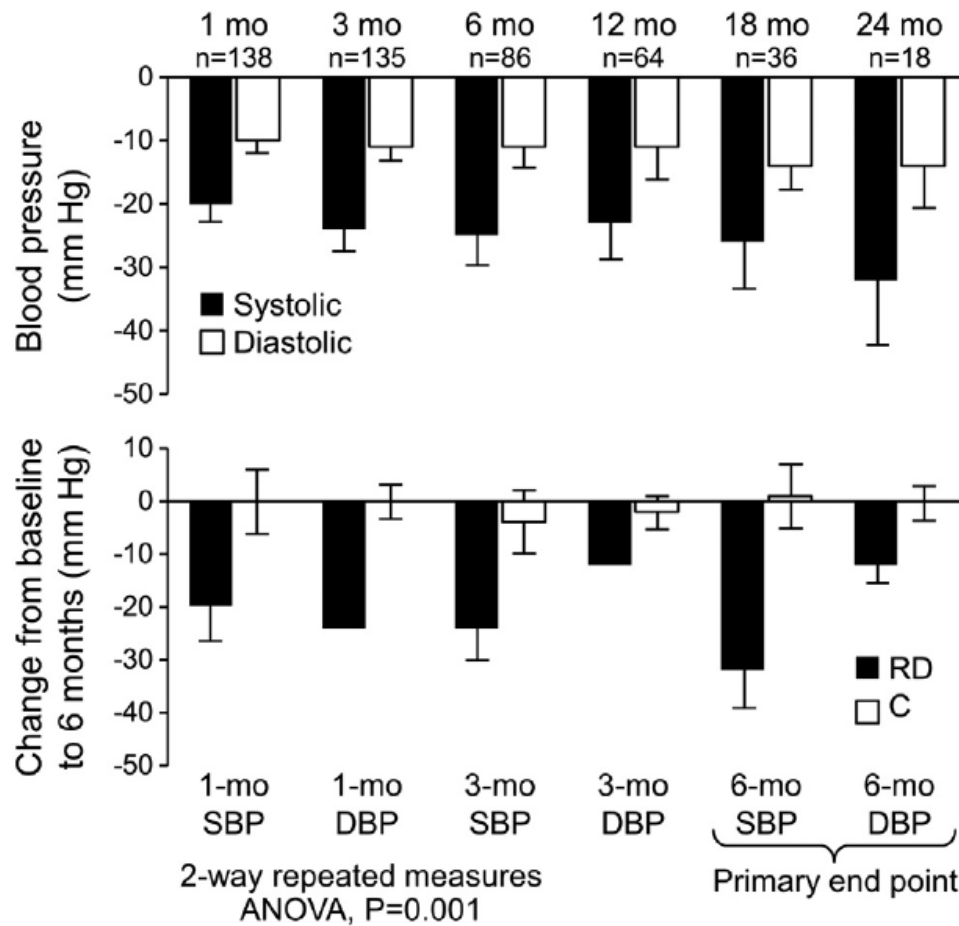
Doentes excluídos para DNR (N = 143)

- HTA controlada após ajuste terapêutica (N = 59)
- Identificação de causas 2.^{as} de HTA (N = 20)
- Anatomia renal desfavorável para DNR (N = 13)
- eDFG <45ml/min/1,73m² (N = 39)
- Recusa do doente (N = 6)
- Outras causas (N = 6)

Doentes submetidos a DNR
N = 34

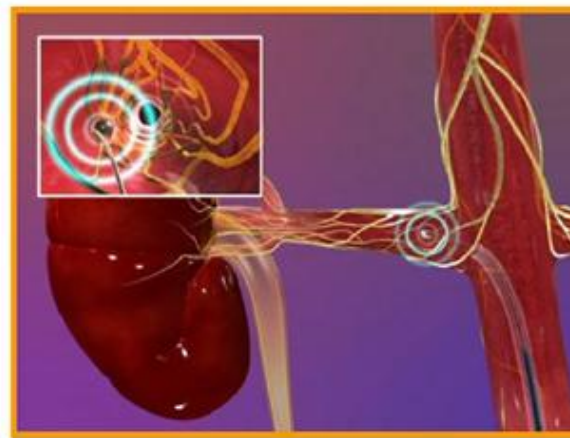
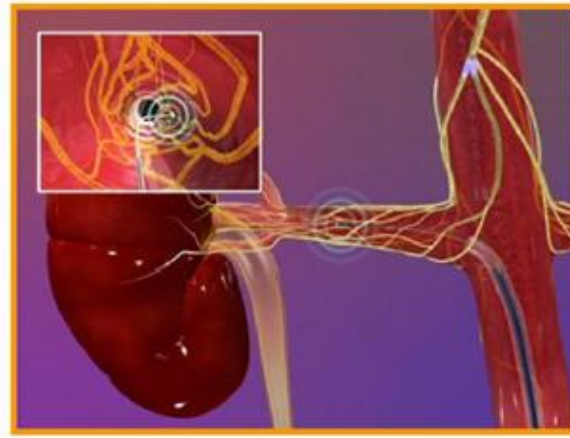
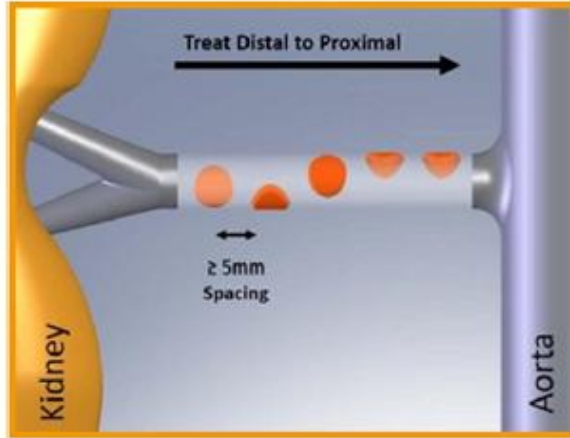
6 meses de seguimento
N = 22





Symplicity HTN-1 Investigators. Catheter-based renal sympathetic denervation for resistant hypertension: durability of blood pressure reduction out to 24 months. *Hypertension* 2011;57:911-7.

Esler MD, Krum H, Sobotka PA, Schlaich MP, Schmieder RE, Bohm M. Renal sympathetic denervation in patients with treatment-resistant hypertension (The Symplicity HTN-2 Trial): a randomised controlled trial. *Lancet* 2010;376:1903-9.



Critérios standard de inclusão na maioria dos estudos

- ✓ Maior que 18 anos
- ✓ PAS maior que 160 ou maior que 150mmHg em diabéticos
- ✓ Uso de 3 ou mais antihipertensivos
- ✓ Uso de 1 diurético
- ✓ Função glomerular maior que 45ml/min/1,73 m²
- ✓ Descartar causas secundárias
- ✓ Descartar diabetes tipo 1
- ✓ Ausência de anormalidades renovasculares
- ✓ Ausência de doença valvar
- ✓ Ausência de gravidez
- ✓ Uso de medicação estável nos últimos 3 meses

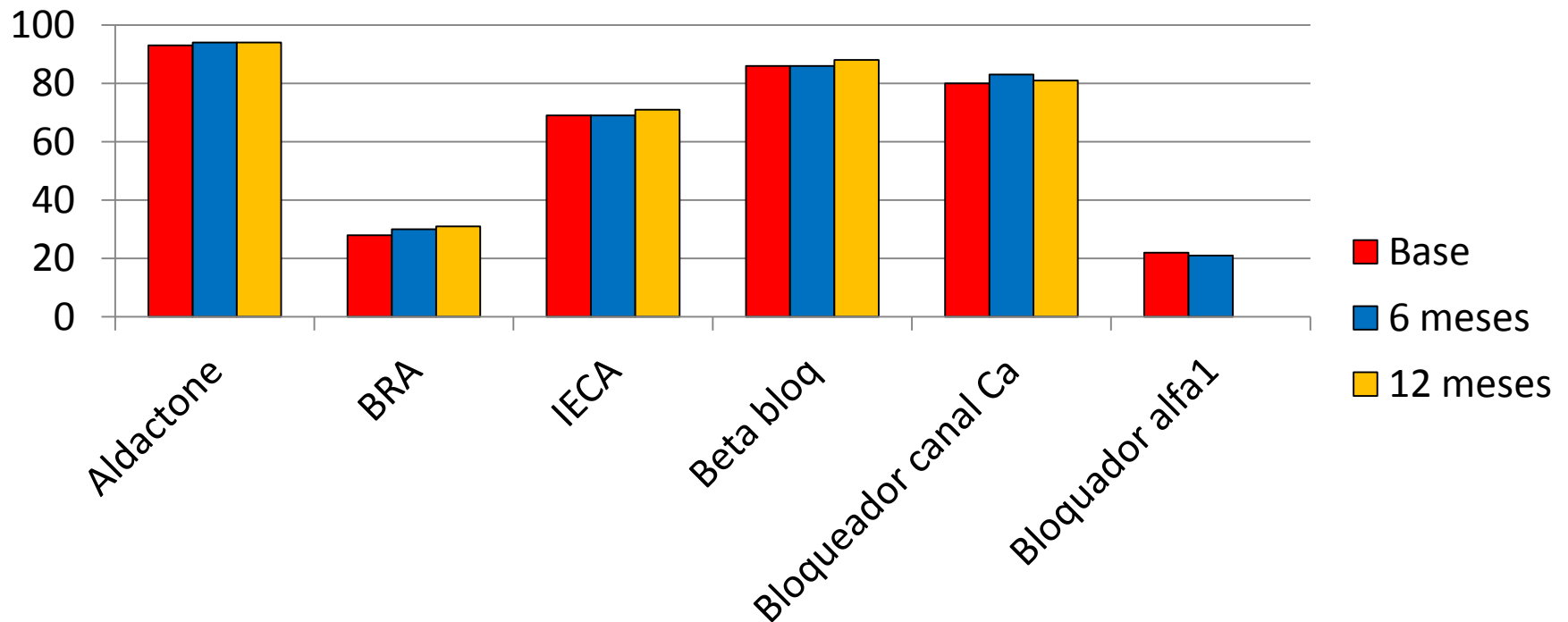
Eventos adversos

Autor	Ano	Cateter	Efeito adverso
Esler Simplicity 2	2010	Simplicity	1 pseudoaneurisma femular 1 infecção urinária 1 admissão por parestesia 7 (13%) bradicardia intraprocedimento resolvido com atropina
Ewen	2014	Simplicity	NR
Mahfoud	2014	Simplicity	NR
Pokusholav	2012	Navistar ThermoCool	Sem complicações no procedimento ou seguimento
Bhatt Simplicity 3	2014	Simplicity	Morte 0,6% Infarto do miocárdio 1,7% Elevação creatinina >50% 1,4% Evento embólico 0,3% Crise hipertensiva 2,6% AVC 1,1% Estenose de artéria renal nova >70% da luz 0,3%

Percutaneous renal denervation in patients with treatment-resistant hypertension: final 3-year report of the Symplicity HTN-1 study

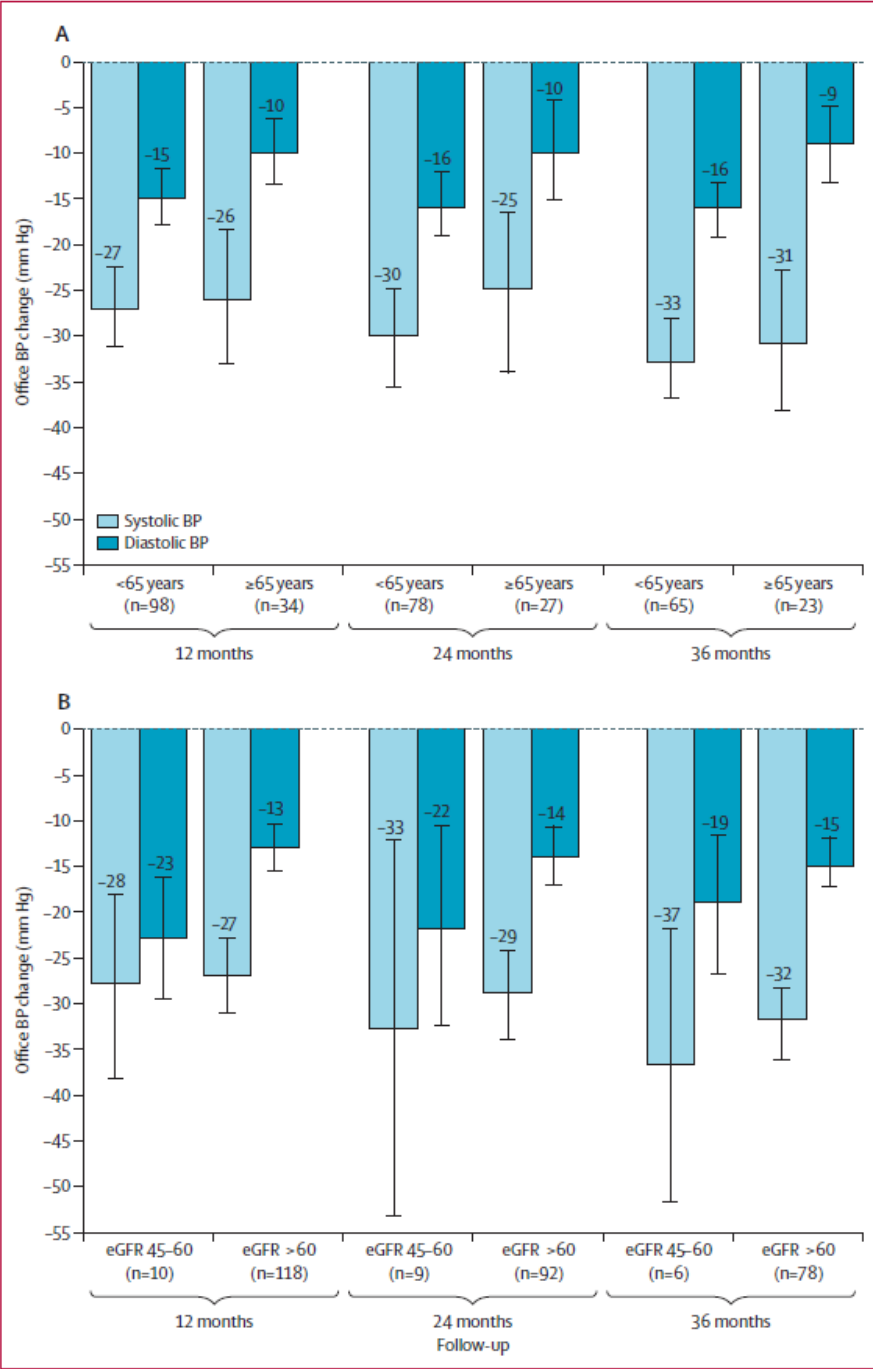
Henry Krum, Markus P Schlaich, Michael Böhm, Felix Mahfoud, Krishna Rocha-Singh, Richard Katholi, Murray D Esler

Uso de medicações antihipertensivas



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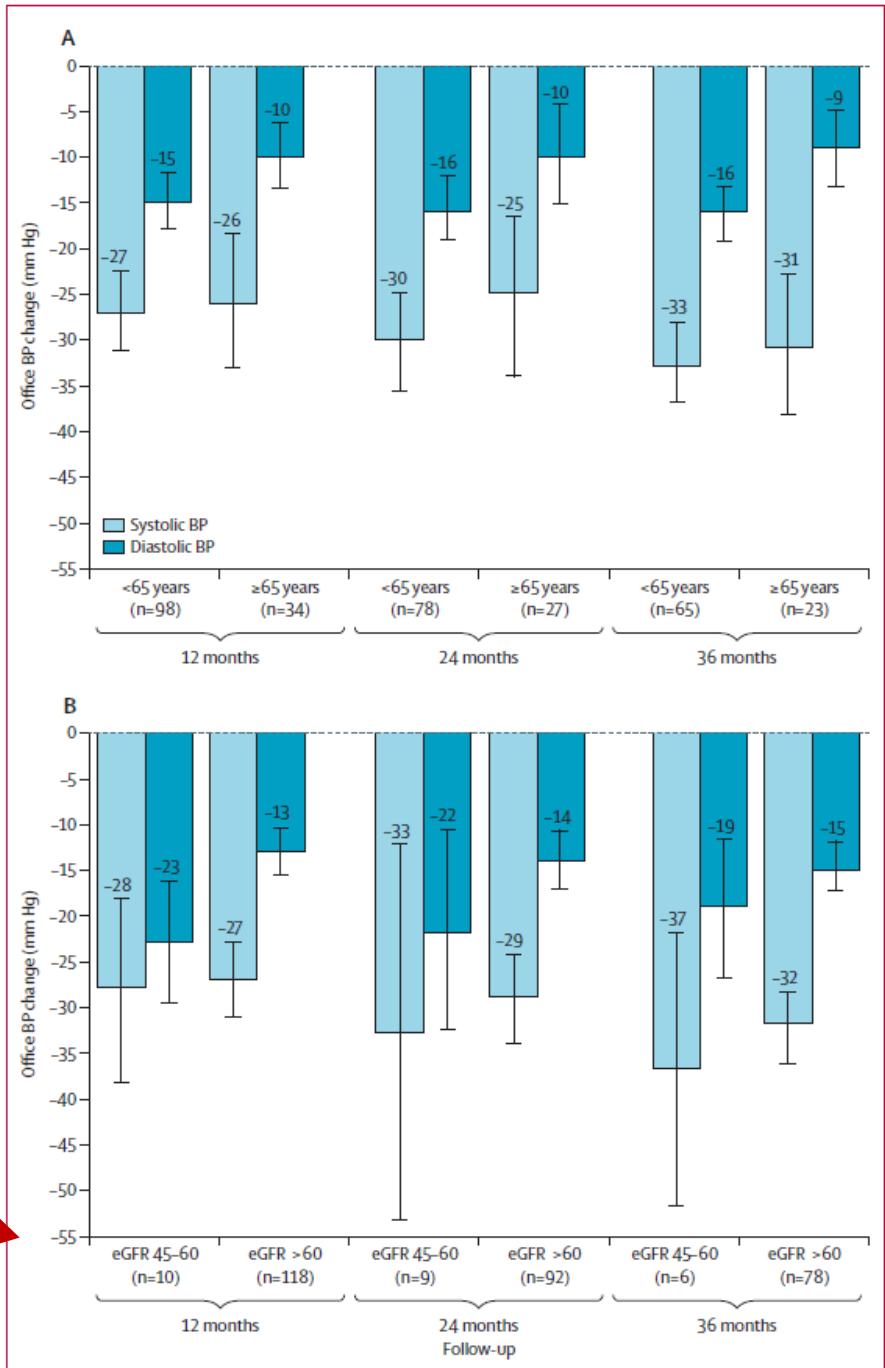
Idade



Percutaneous renal denervation in patients with treatment-resistant hypertension: final 3-year report of the Symplicity HTN-1 study

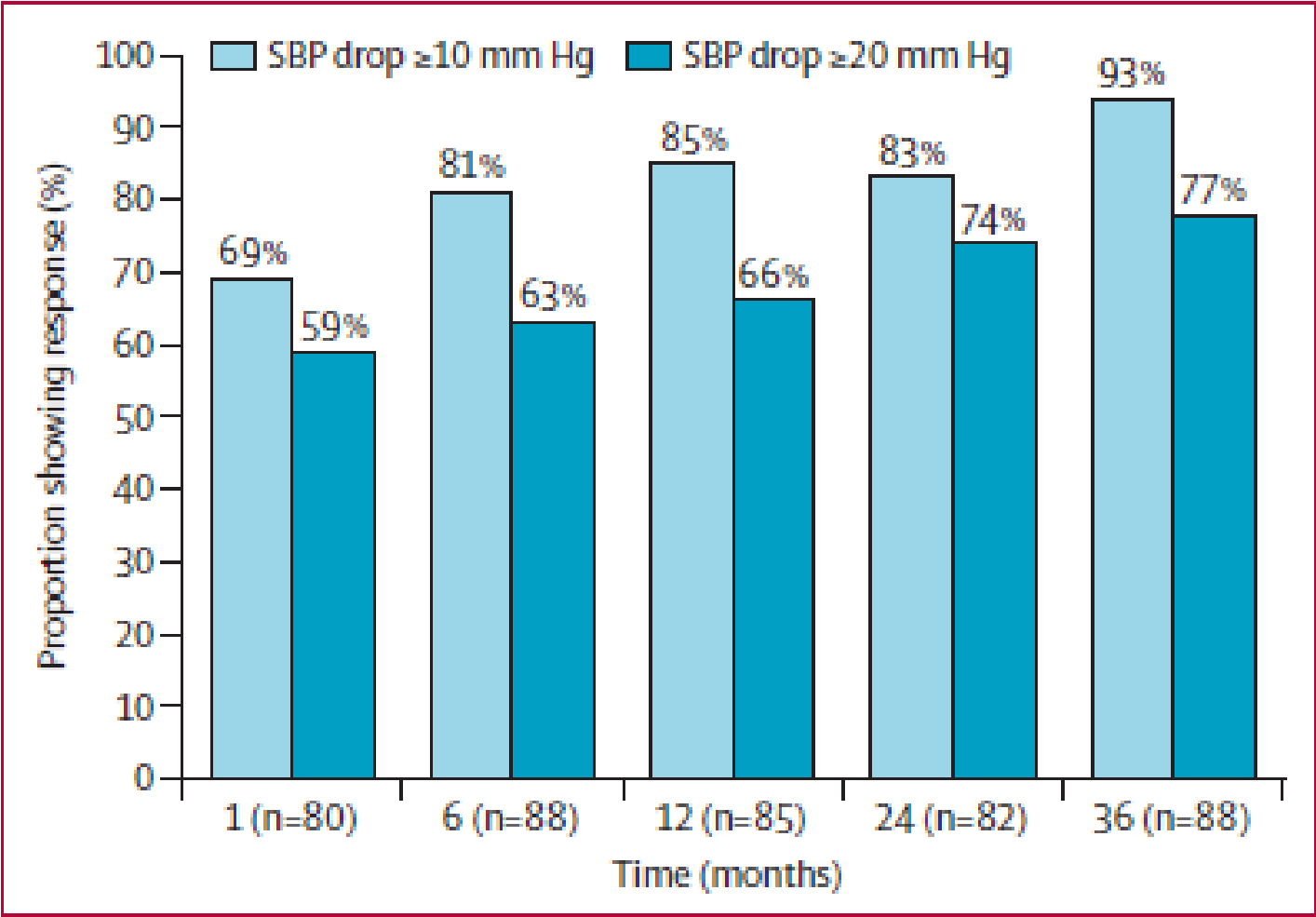
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Filtração glomerular



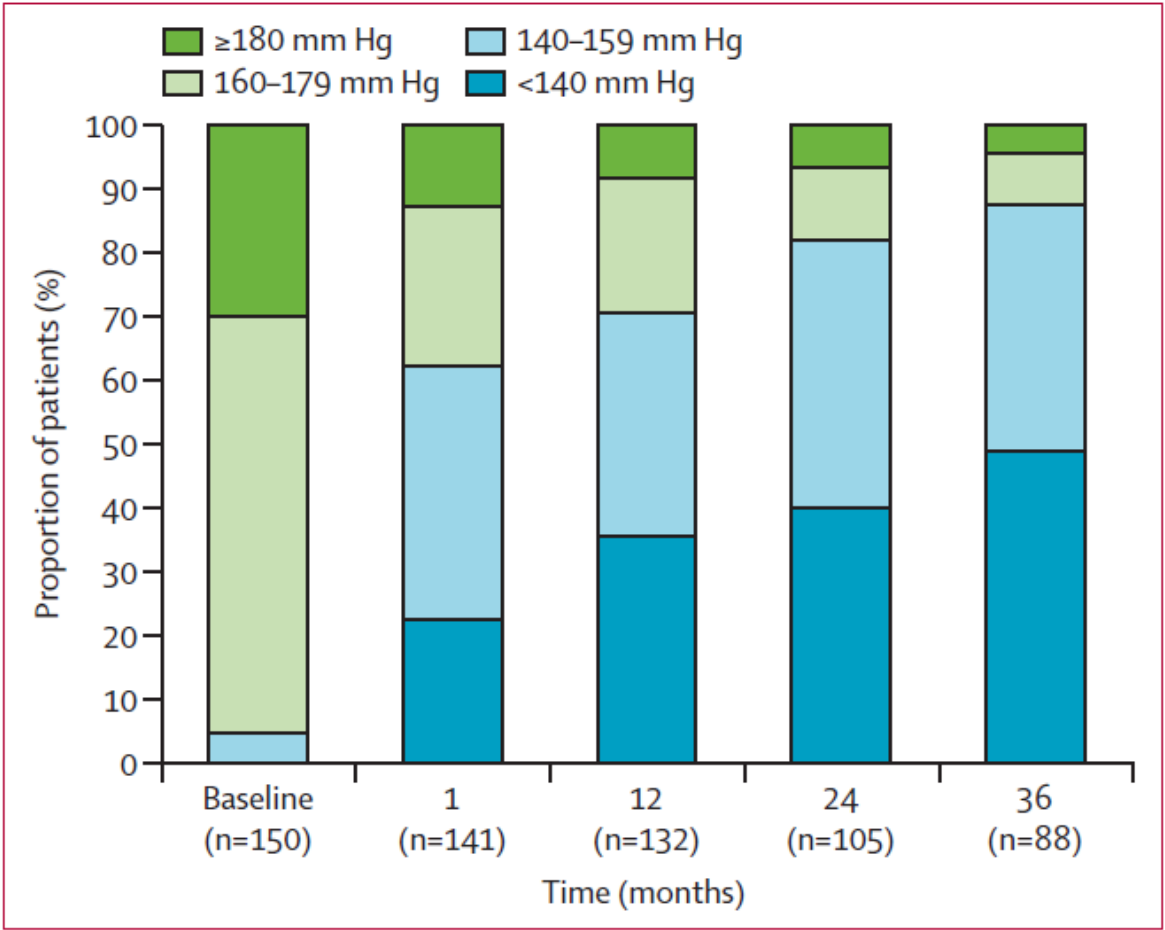
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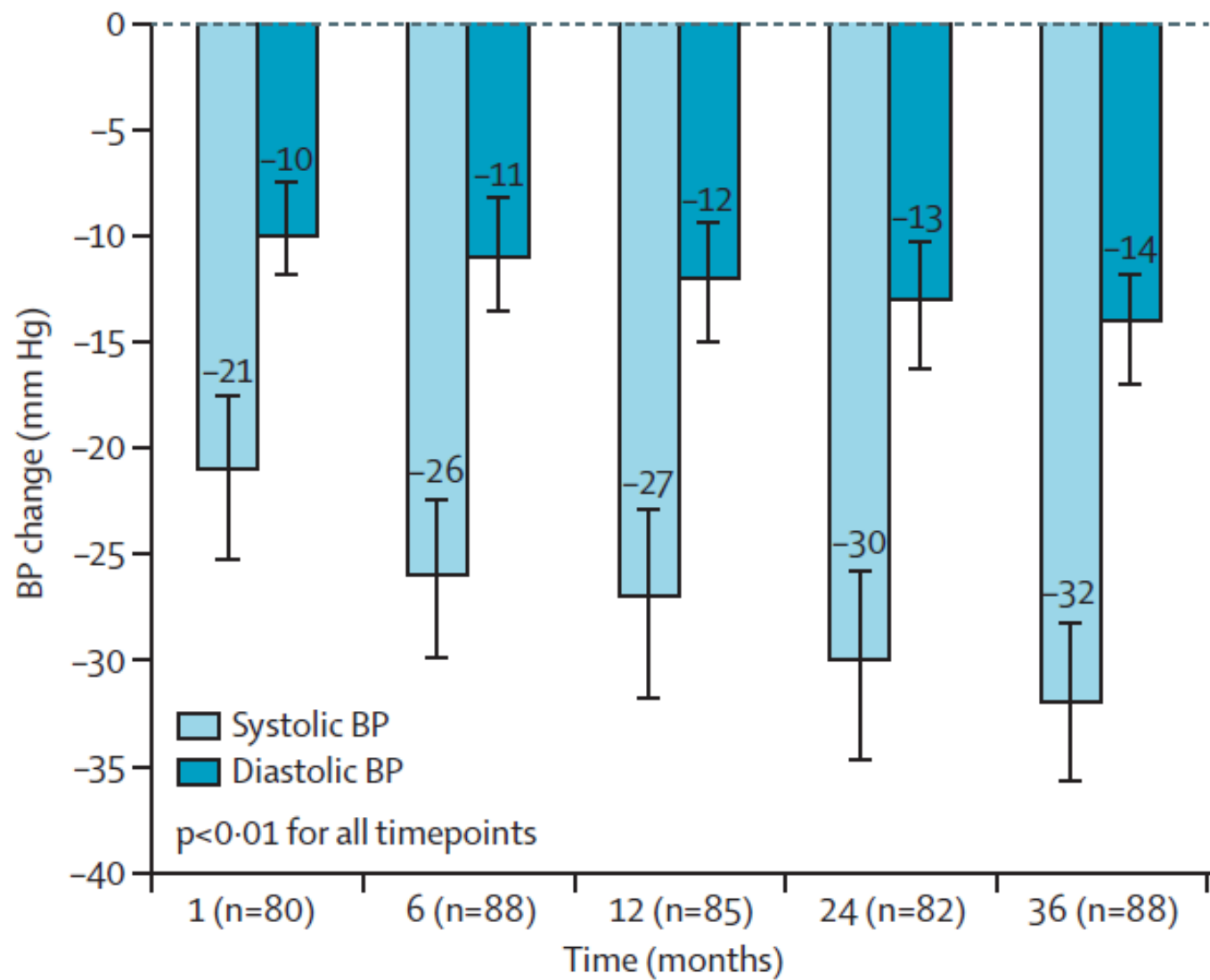
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Accepted Manuscript

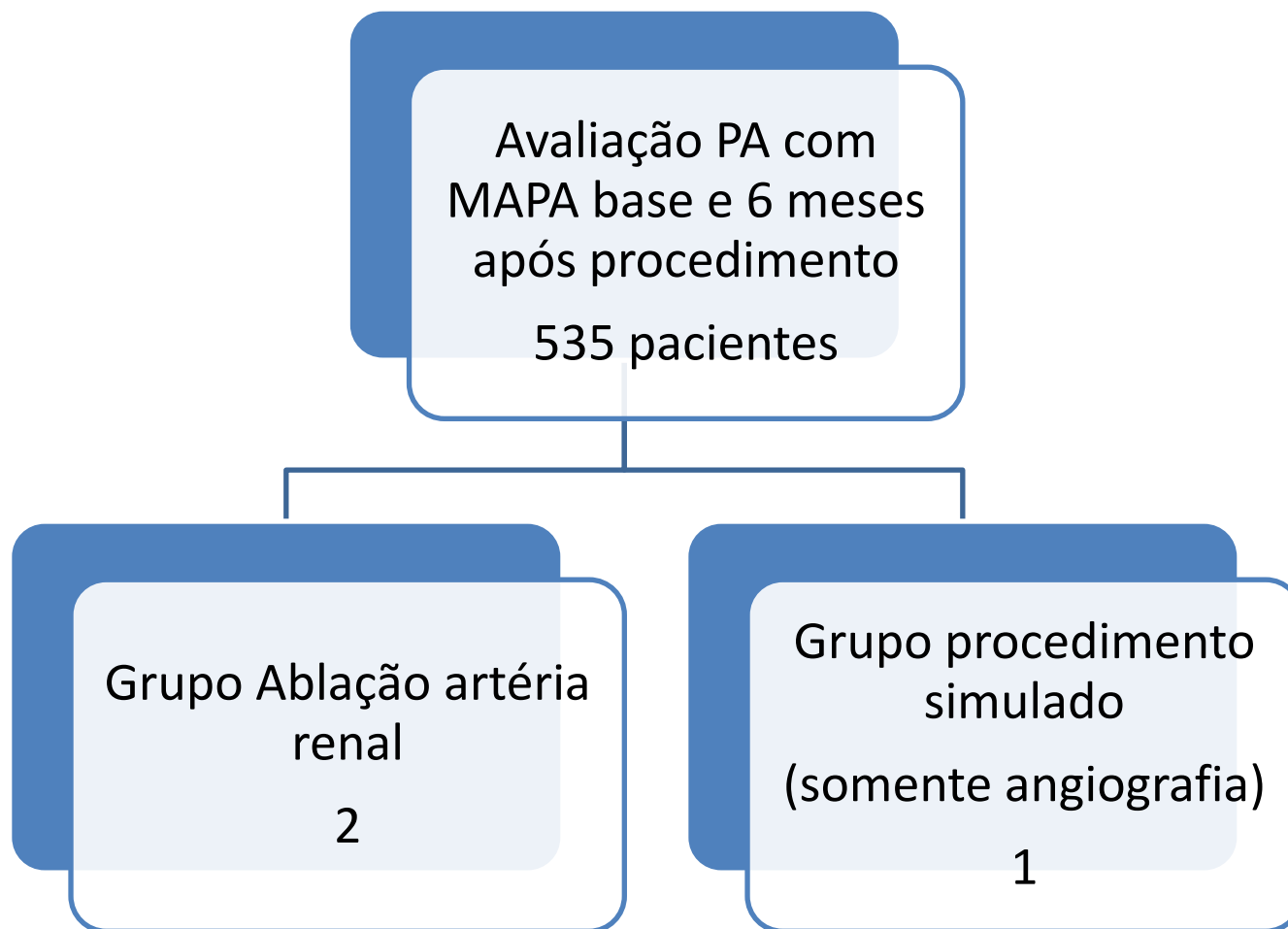
Impact of Renal Denervation on 24-hour Ambulatory Blood Pressure: Results from SYMPPLICITY HTN-3

George L. Bakris, MD,* Raymond R. Townsend, MD,† Minglei Liu, PhD,‡ Sidney A. Cohen, MD, PhD,†† Ralph D'Agostino, PhD,§ John M. Flack, MD, MPH,|| David E. Kandzari, MD,¶ Barry T. Katzen, MD,# Martin B. Leon, MD,** Laura Mauri, MD, MSc,†† Manuela Negoita, MD,‡ William W. O'Neill,‡‡ Suzanne Oparil, MD, §§ Krishna Rocha-Singh, MD,|||| Deepak L. Bhatt, MD, MPH¶¶ for the SYMPPLICITY HTN-3 Investigators

Journal of the American College of Cardiology

SYMPPLICITY HTN-3

George L. Bakris, MD,* Raymond R. Townsend, MD,† Minglei Liu, PhD,‡ Sidney A. Cohen, MD, PhD,†† Ralph D'Agostino, PhD,§ John M. Flack, MD, MPH,|| David E. Kandzari, MD,¶ Barry T. Katzen, MD,# Martin B. Leon, MD,** Laura Mauri, MD, MSc,†† Manuela Negoita, MD,‡ William W. O'Neill,‡‡ Suzanne Oparil, MD, §§ Krishna Rocha-Singh, MD,|||| Deepak L. Bhatt, MD, MPH¶¶ for the SYMPPLICITY HTN-3 Investigators



SYMPPLICITY HTN-3

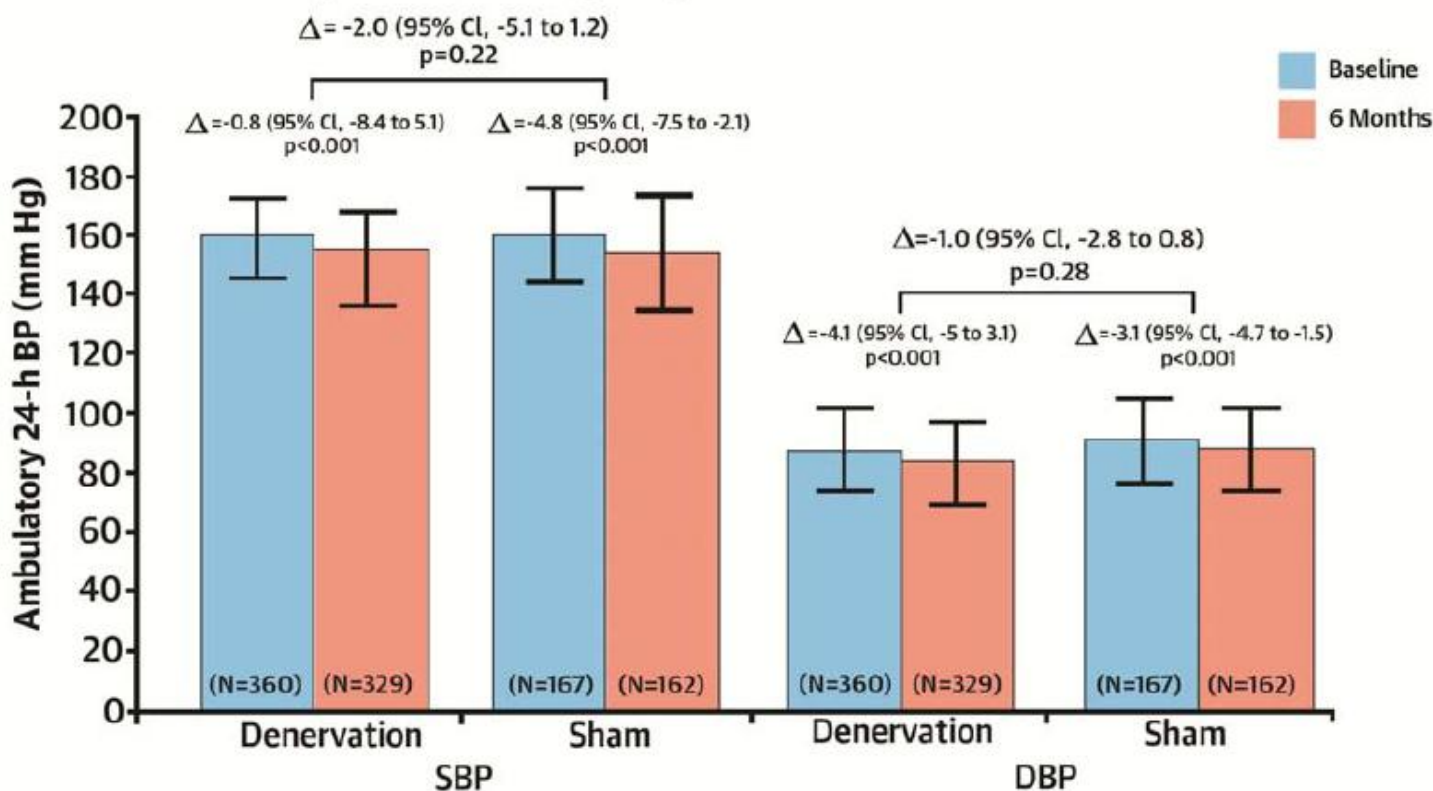
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- Critério de inclusão: standard
- Critérios de exclusão:
 - standard
 - Internação por HAS no ultimo ano
 - Estenose de artéria renal maior que 50%
 - Aneurisma de arteria renal, multiplas arterias
 - Diametro da arteria renal menor que 4mm ou arteria renal curta menor que 20mm
 - Sucesso diferença maior que 5mmHg em relação ao placebo

SYMPPLICITY HTN-3

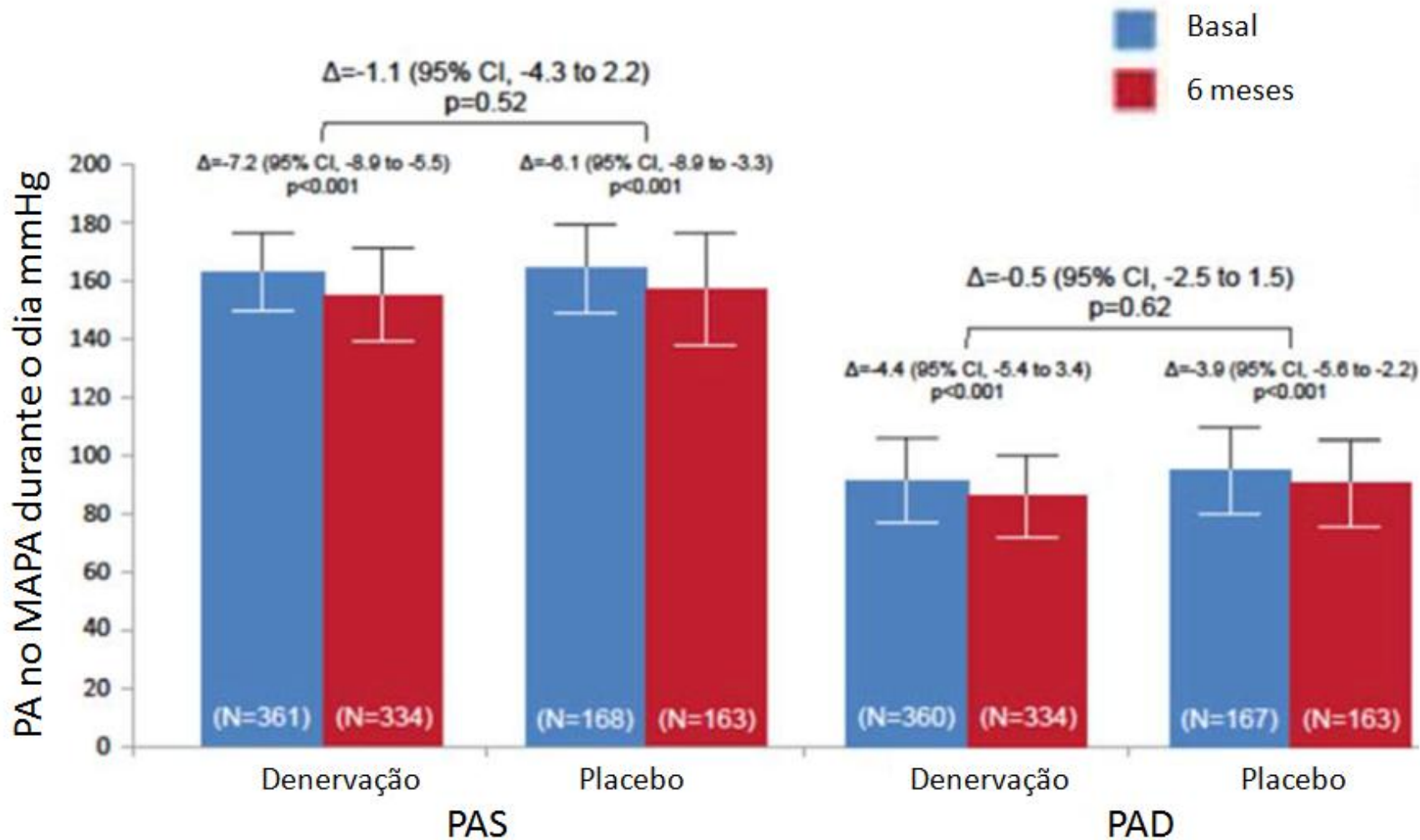
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Change in Ambulatory Systolic Blood Pressure for All Patients and Prespecified Subgroups in the SYMPPLICITY HTN-3 Trial



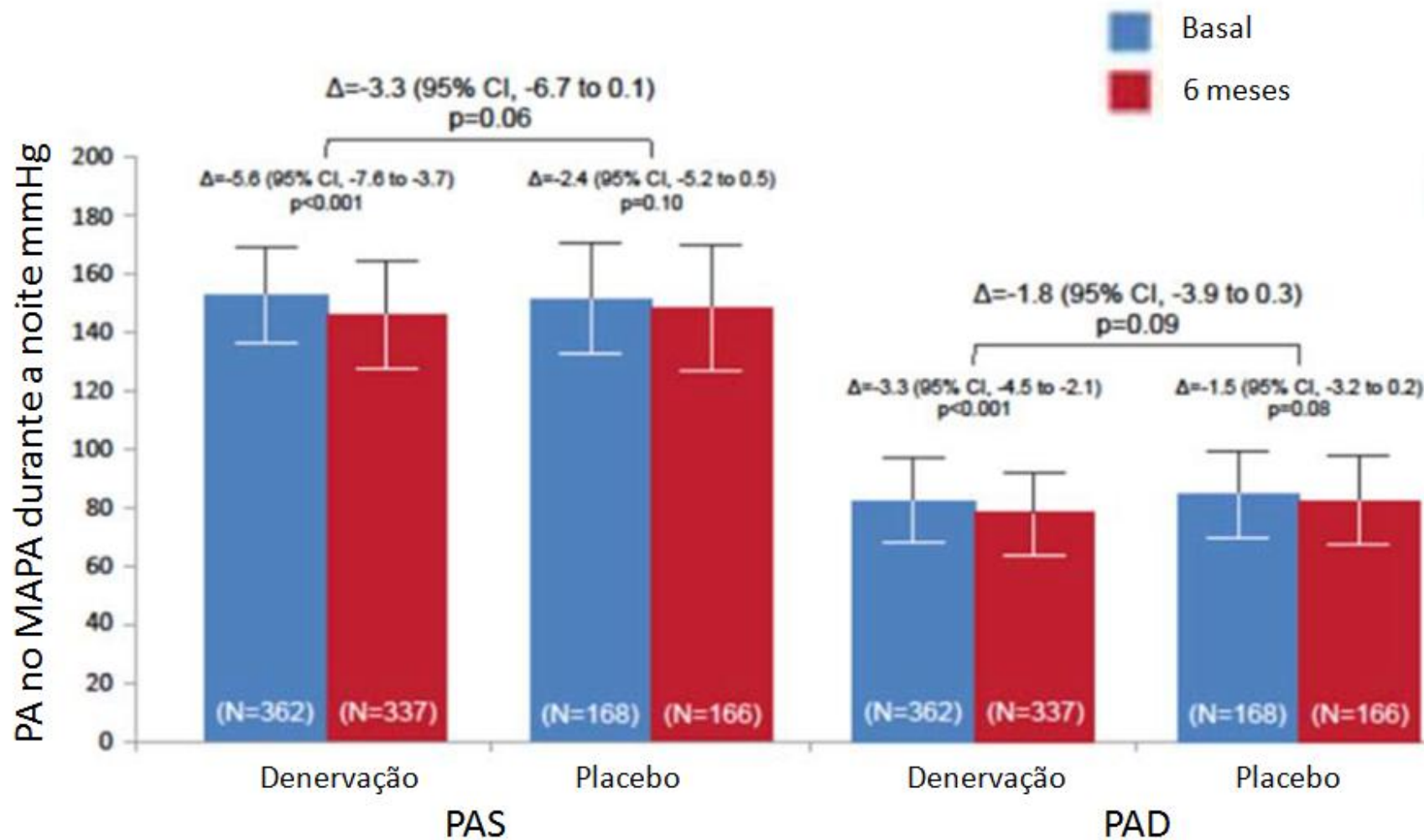
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SYMPPLICITY HTN-3

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SYMPPLICITY HTN-3

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Conclusão

The current trial confirms the safety of renal denervation with the Symplicity catheter; however, a significant BP lowering effect on 24-hour ambulatory BP was not observed. Further clinical research using rigorous trial design will be required to understand if renal denervation has any role in the treatment of resistant hypertension.

- O estudo confirma a segurança de denervação renal com o cateter Symplicity; no entanto, um efeito redutor significativo na PA no MAPA de 24 horas não foi observada. Além disso pesquisas clínicas com desenho rigoroso serão necessárias para entender se a desnervação renal tem qualquer papel no tratamento de hipertensão resistente.

Meta-Analysis of the Effect of Renal Denervation on Blood Pressure and Pulse Pressure in Patients with Resistant Systemic Hypertension

Samir B. Pancholy, MD Ghanshyam Palamaner Subash Shantha, MD Tejas M. Patel, MD Paul A. Sobotka, MD David E. Kandzari, MD

PII: S0002-9149(14)01365-4

DOI: [10.1016/j.amjcard.2014.06.018](https://doi.org/10.1016/j.amjcard.2014.06.018)

Reference: AJC 20545

To appear in: *The American Journal of Cardiology*

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Revised Date: 16 June 2014

Accepted Date: 25 June 2014

Autor	Ano	Cateter	Número Pacientes Denervação	Número de Pacientes Controle	Não respondedores
Esler Simplicity 2	2010	Simplicity	52	53	16%
Ewen	2014	Simplicity	50	10	14%
Mahfoud	2014	Simplicity	55	17	NR
Pokusholav	2012	Navistar ThermoCool	13	14	0%
Bhatt	2014	Simplicity	364	171	NR

Samir B. Pancholy, MD Ghanshyam Palamaner Subash Shantha, MD Tejas M. Patel,
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- Em conclusão a meta-análise mostra que Denervação renal é superior a terapia médica otimizada na redução da PA, no entanto, a heterogeneidade entre as populações de estudo é alta, e mais dados são necessários para melhor comparar as estratégias de tratamento.