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POSTER PRESENTATION

Long-term impacts of Renal Denervation on office and 24-hour ambulatory blood pressure: a systematic review and meta-analysis of sham-controlled studies

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1 BACKGROUND

Renal denervation has re-emerged as a device-based therapy for hypertension, yet durability of effect versus sham over long follow-up remains debated. We synthesized sham-controlled evidence using each trial's longest available follow-up.

2 METHODS

We systematically searched PubMed, Scopus, Web of Science and Google Scholar from inception to 1 May 2026.

PubMed | **Scopus** | **Web of Science** | **Google Scholar**

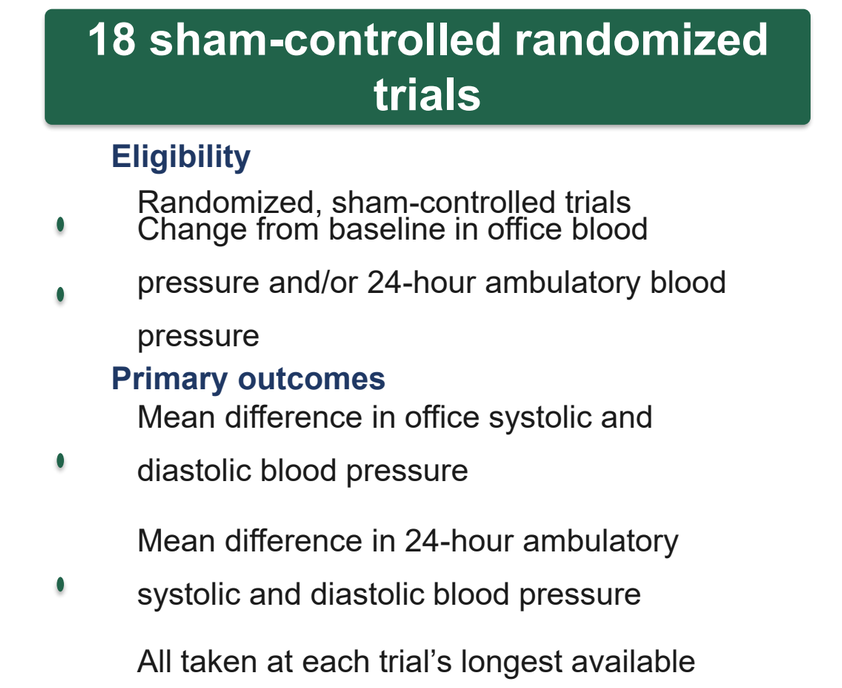
18 sham-controlled randomized trials

Eligibility

- Randomized, sham-controlled trials
- Change from baseline in office blood pressure and/or 24-hour ambulatory blood pressure

Primary outcomes

- Mean difference in office systolic and diastolic blood pressure
- Mean difference in 24-hour ambulatory systolic and diastolic blood pressure
- All taken at each trial's longest available follow-up



KEY MESSAGE
Blood-pressure lowering with renal denervation was sustained at each trial's longest follow-up.

3 RESULTS

Office SBP	Office DBP
−15.54 mmHg	**−8.19** mmHg
95% CI −18.56 to −12.52	95% CI −9.89 to −6.50

24-h ambulatory SBP	24-h ambulatory DBP
−9.21 mmHg	**−5.39** mmHg
95% CI −11.19 to −7.23	95% CI −6.50 to −4.28

Mean difference vs sham at longest follow-up

Across 18 sham-controlled trials, using each study's longest follow-up, renal denervation **consistently lowered blood pressure versus sham.** On average, office systolic pressure fell by **15.54 mmHg** (95% CI −18.56 to −12.52) and office diastolic by **8.19 mmHg** (95% CI −9.89 to −6.50). The 24-hour ambulatory readings showed smaller but still meaningful drops: systolic **−9.21 mmHg** (95% CI −11.19 to −7.23) and diastolic **−5.39 mmHg** (95% CI −6.50 to −4.28).

While the amount of benefit varied between studies ($I^2 \approx 97\%$ across outcomes), the direction of effect was uniformly in favor of renal denervation at short and longer follow-up windows, indicating a durable reduction in both office and ambulatory blood pressure.

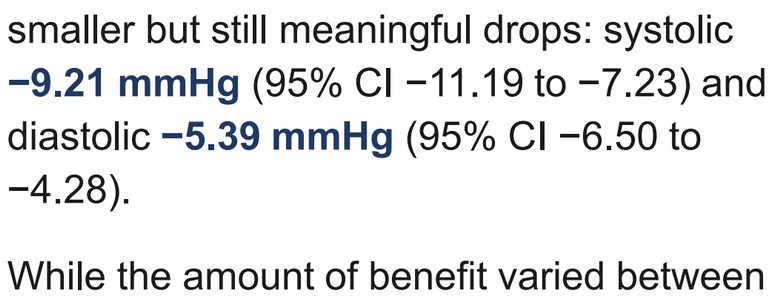


Figure 1. Office systolic blood pressure — random-effects model; I^2 = 97.8%, τ^2 = 32.15, p < 0.0001.

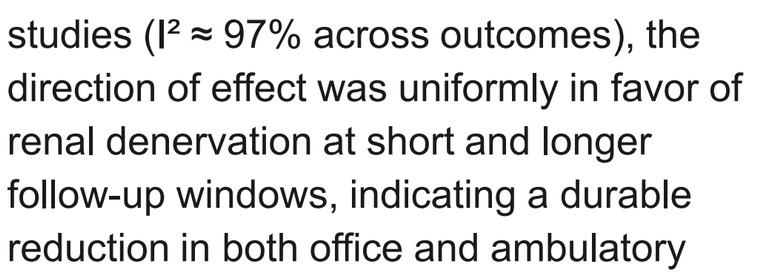


Figure 2. Office diastolic blood pressure — random-effects model; I^2 = 98.0%, τ^2 = 9.34, p < 0.0001.

4 AMBULATORY OUTCOMES

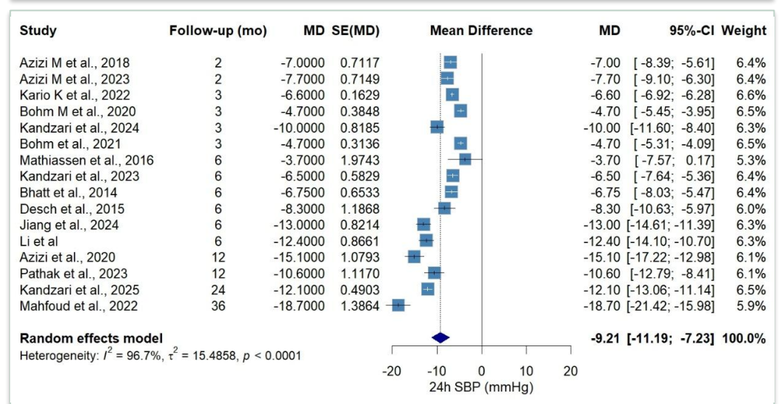


Figure 3. 24-hour ambulatory systolic blood pressure — random-effects model; I^2 = 96.7%, τ^2 = 15.49, p < 0.0001.

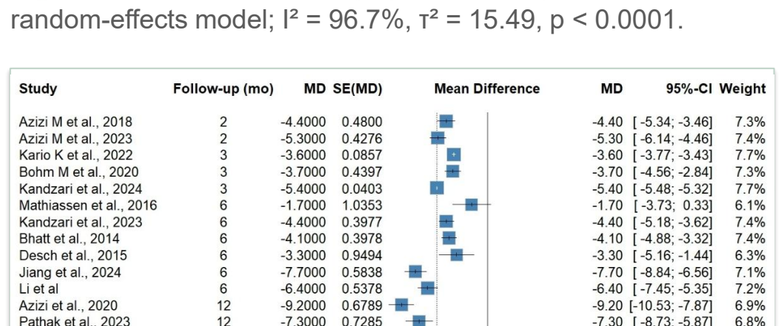


Figure 4. 24-hour ambulatory diastolic blood pressure — random-effects model; I^2 = 97.6%, τ^2 = 4.16, p < 0.0001.

5 CONCLUSIONS

Using the longest available follow-up from sham-controlled randomized trials, renal denervation is associated with durable reductions in both office and 24-hour ambulatory blood pressure.

Despite substantial heterogeneity, the pooled effects suggest a clinically meaningful benefit that persists beyond the short term.

Future directions

Standardize outcome reporting · explore sources of heterogeneity · determine which patient subgroups derive the greatest long-term benefit.

