NEW PAPERS

Renal denervation in Asia: Why I'm focusing on nighttime and morning blood pressure

KAZUOMI KARIO
ISH Secretary
Division of Cardiovascular Medicine, Department of Medicine,
Jichi Medical University School of Medicine, Japan

I have spent years trying to help patients reach their blood pressure (BP) control targets, only to watch that control unravel outside the clinic – especially overnight and in the early morning. That is why I paid close attention to the 2025 Asia Renal Denervation Consortium (ARDeC) consensus statement (endorsed by the HOPE Asia Network), developed at the second ARDeC conference in 2024.[1] Experts from multiple Asian countries intentionally framed their recommendations around Asian hypertension phenotypes and seven practical topics, ranging from BP-lowering efficacy and technique to indications, anatomy, and shared decision-making.[1]

Toward true 24-hour blood pressure control

What convinces me first is the consistency of BP reduction across measurement methods. The statement emphasizes that transcatheter renal denervation (RDN) safely and effectively reduces office, home, and 24-hour ambulatory BP, regardless of whether antihypertensive medications are being used.[1] This aligns with a broad sham-controlled evidence base across different platforms and trial designs.[4–10] For clinicians, that matters because it suggests that the clinical evidence for blood pressure reduction is not confined to a single setting or monitoring approach.[1]

What I find most clinically meaningful, however, is the focus on the "hard" time windows: nighttime and morning BP. ARDeC highlights that RDN significantly reduces nighttime and morning BP – periods that are often difficult to control with medication strategies guided mainly by office BP readings.[1] The statement explicitly links this to Asian hypertension patterns, noting that nocturnal and morning hypertension are common in Asia and that nighttime or morning BP may reflect cardiovascular risk better than daytime or office BP.[1] From my perspective, this is where RDN may contribute most: helping achieve optimal 24-hour BP control, including nighttime and morning BP, through continuous sympathetic modulation (**Figure 1**).[2]

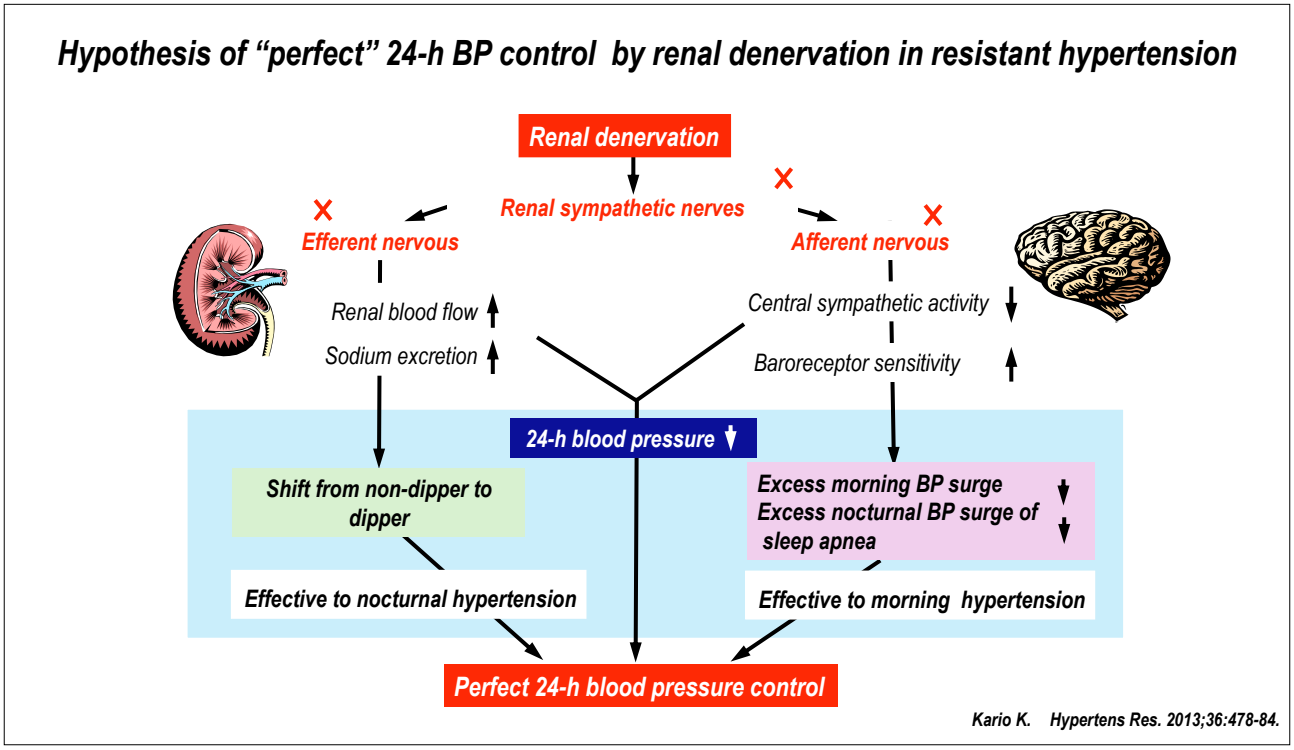
Durability as a core value of device therapy

Durability is the second message I take home. The consensus statement notes that BP lowering after RDN persists for at least 10 years.[1] In my experience, long-term control is exactly where pharmacologic strategies can fail – not because drugs are ineffective, but because adherence issues, side effects, and therapeutic inertia accumulate over time. A durable, adherence-independent BP-lowering effect is precisely what a device-based therapy should add to our treatment toolbox. Longer-term follow-up and real-world data continue to inform safety and effectiveness beyond pivotal trials.[10]

Why renal artery anatomy matters

The third insight is anatomical – and it helps explain why modern RDN procedural approaches have evolved and improved. The ARDeC consensus reviews renal artery branching and nerve distribution patterns and emphasizes that nerves converge closest to the vessel wall distal to

Figure 1



the primary bifurcation.[1] They cite estimates that approximately 75% of nerve fibers lie within 5 mm of the distal main renal artery lumen (suggesting that a 5-mm ablation depth could affect >80% of fibers), and that most nerves are within 3 mm of the lumen in post-bifurcation branches.[1] The statement also notes evidence that treating the main artery plus branches can produce greater reductions in renal norepinephrine and BP than treating the main artery alone.[1] This is how I now explain the technique to colleagues: we are increasingly targeting sites where the nerves are most accessible.[1]

Patient selection: reproducibility is everything

For me, the practical value of a consensus statement is whether it makes patient selection more reproducible. Here, ARDeC is unambiguous: indications require lifestyle modification and antihypertensive therapy plus uncontrolled out-of-office BP documented by ambulatory BP monitoring (ABPM) or home BP monitoring (HBPM).[1] The thresholds are explicit – ABPM 24-hour BP ≥130/80 mmHg (or awake ≥135/85, or asleep ≥120/70), and HBPM morning/evening ≥135/85 (or asleep ≥120/70).[1] I also appreciate the recommendation to perform ABPM (after directly observed medication intake in treated patients), because it provides the most comprehensive evidence regarding BP-lowering efficacy.[1]

Resistant hypertension confirmed by out-of-office BP represents a very high-risk phenotype, often accompanied by nocturnal and/or morning hypertension. In one report, the incidence of cardiovascular events in patients with HBPM-confirmed resistant hypertension was 34.7 per 1000 person-years, significantly higher than in those with well-controlled hypertension on ≥3 drugs including a diuretic (11.9 per 1000 person-years; P<0.001).[3] This kind of risk gradient is one reason I prioritize accurate out-of-office confirmation before discussing device-based therapy.

The paper also reinforces key "do not miss" items in the workup. It states plainly that RDN should not be performed in patients with untreated endocrine hypertension.[1] Procedurally, it describes thin-slice contrast CT as essential for identifying anterior and posterior divisions of the main renal artery and recommends keeping ablation at least 5 mm away from abnormal anatomy (including preexisting stents).[1] These are exactly the details I want embedded in referral pathways and operator checklists.[1]

Table 1. Determinants of RDN effectiveness [1]

Domain	Determinants / examples
Patient characteristics	**Neurogenic hypertension** (• *Obesity hypertension* • *Mild essential hypertension* • *Hypertension with high 24-hour heart rate on ABPM ≥ 73.5 beats/min*) **Young age** **Ethnicity** (*e.g., Asian*) **Risk factors** (• *Obstructive sleep apnea* • *Body mass index*) **Heart rate** (• *Basal office heart rate ≥ 70 beats/min* • *Heart rate variability*) **Systolic blood pressure** (• *Amplitude* • *Variability*) **Ambulatory blood pressure** (• *Blood pressure variability*) **Hypertension phenotype** (• *Nocturnal hypertension* • *Orthostatic hypertension* • *Isolated systolic hypertension in the young* • *Morning hypertension*)
Biomarkers	**Norepinephrine spillover** **Muscle sympathetic nerve activity** **Plasma renin activity**
Invasive / provocative testing	**Arterial stiffness** (• *Pulse wave velocity* • *Aortic distensibility* • *Central arterial pressure* • *Augmentation index*) **Renal artery resistance and wave speed** **Drug challenge** **Baroreceptor sensitivity** **Excitatory/inhibitory nerve stimulation**
Procedural variables	**Number of treatment applications** **Four-quadrants ablations** **Anatomic site** (• *Distal branch vessels* • *Accessory renal arteries*)

Shared decision-making and identifying potential responders

Finally, I am glad ARDeC treats RDN as preference-sensitive care. The task force recommends initiating shared decision-making early in the pre-procedure phase, giving patients time to consider their treatment options and expectations.[1] The statement also reminds us that "response" is multifactorial – patient phenotype, biomarkers, provocative testing, and procedural variables can all matter (**Table 1**).[1] That framing helps me counsel patients honestly: RDN is not "magic", but it is increasingly evidence-based and protocol-driven.[1,4–10]

So where does this leave me today? In Japan, RDN has been introduced in clinical practice for strictly selected patients with resistant hypertension confirmed by ABPM or HBPM, typically despite treatment with three or more antihypertensive drugs including a diuretic. At ARDeC, however, we intentionally did not restrict the discussion only to resistant hypertension. I am increasingly comfortable discussing RDN as an evidence-based adjunct for resistant or otherwise uncontrolled hypertension – especially when the true burden is at night or in the early morning and remains above threshold on ABPM or HBPM despite appropriate therapy.[1,4–10] I also see a clear mandate for disciplined implementation: confirm out-of-office uncontrolled BP, exclude secondary causes, use high-quality imaging, and document shared decision-making.[1]

Most importantly, I am encouraged that the field is now turning toward outcomes that matter: identifying optimal candidates, defining reliable procedural endpoints and response metrics, and testing whether improved 24-hour BP control translates into less organ damage and fewer cardiovascular events.[1]

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Kazuomi Kario – kkario@jichi.ac.jp

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