



Endocrine hypertension

RENIN

**ALDOSTERONE
RENIN
RATIO**

**RESISTANT
HYPERTENSION**

ALDOSTERONE

**PRIMARY
ALDOSTERONISM**



Endocrine hypertension ¹



Primary aldosteronism (PA) is the most frequent form of **endocrine hypertension (HT)**, with a prevalence of 70–140 million (M) in the hypertensive population worldwide and 14–20 M in patients with **resistant hypertension (RHT)**. PA is due either to an aldosterone-producing adenoma (40%) or to adrenal hyperplasia (60%).

Additional forms of endocrine hypertension are associated with:



Phaeochromocytoma



Acromegaly



Hyperthyroidism



Cushing's syndrome



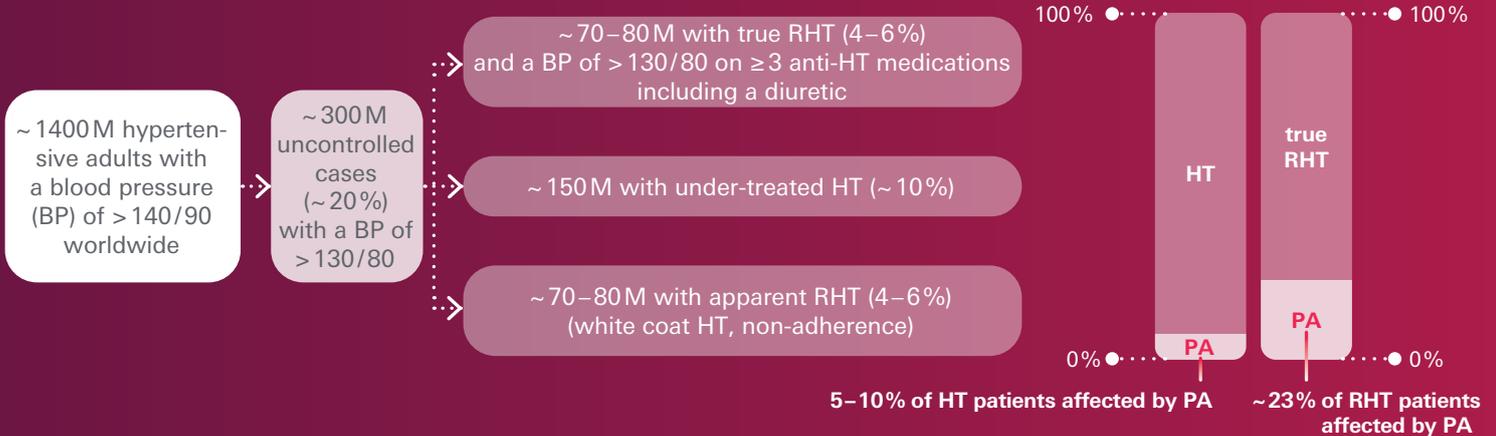
Primary hyperparathyroidism



Hypothyroidism

Estimated prevalence ²

Resistant hypertension (RHT) and primary aldosteronism (PA)

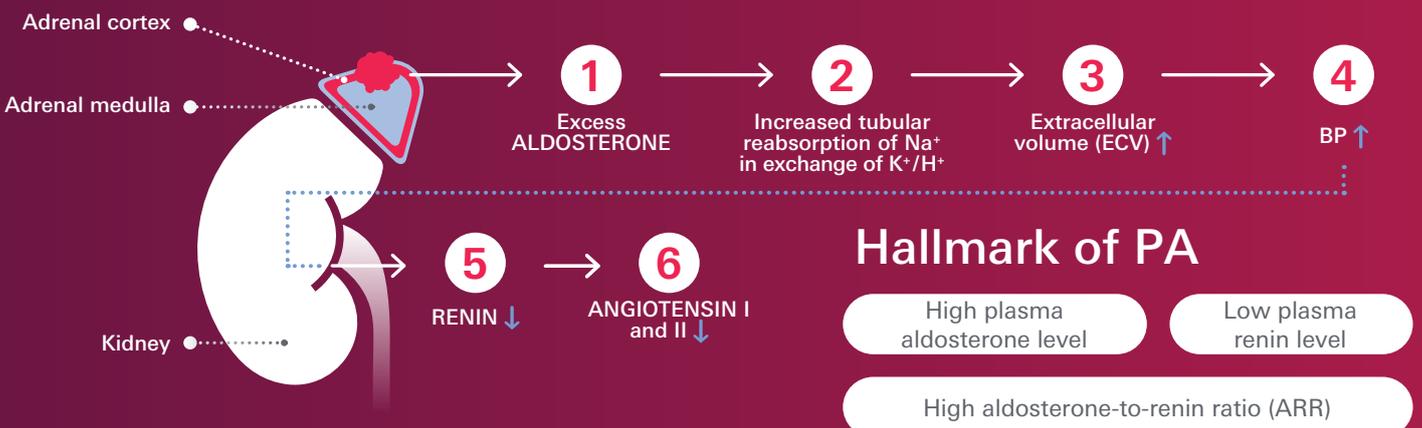


Screening ³

Patient groups to be screened for primary aldosteronism, according to the Endocrine Society guidelines:

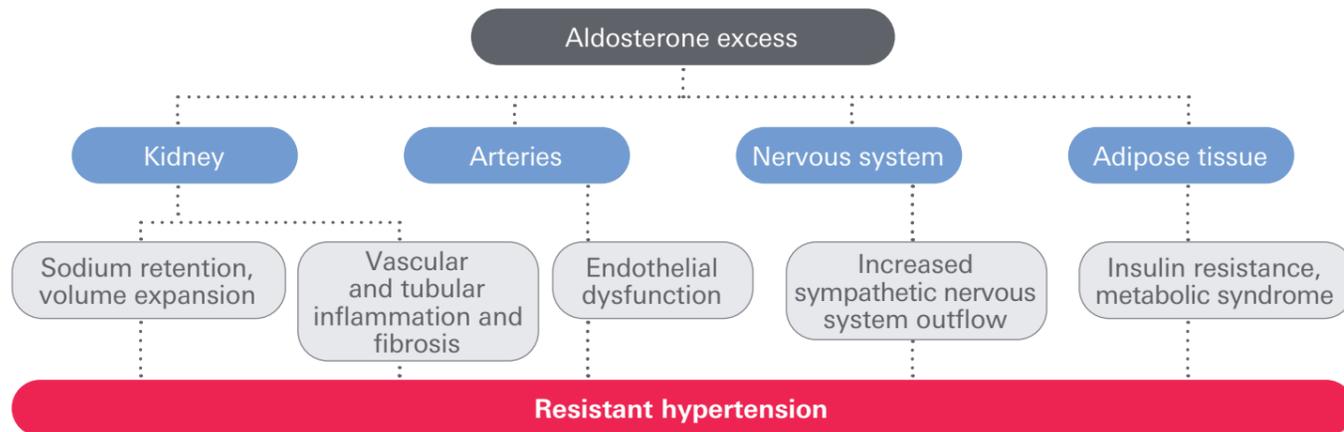
- Sustained HT
- RHT
- HT and family history of PA or cerebrovascular events before age 40
- HT at young age
- HT controlled on ≥4 drugs
- HT and adrenal "incidentalomas"
- HT and hypokalemia
- HT and lone atrial fibrillation

Pathophysiology of primary aldosteronism ⁴



Cardiovascular damage⁵

Mechanisms of cardiovascular (CV) damage linking primary aldosteronism and resistant hypertension:



Increased risk of CV and non-CV events⁶

Diseases and events occurring more frequently in patients with RHT and PA compared to those with essential HT:

Resistant hypertension (RHT)

- Ischemic heart disease
- Heart failure
- Stroke
- End-stage renal disease
- Death

Primary aldosteronism (PA)

- Myocardial infarction
- Atrial fibrillation
- Chronic kidney disease
- Stroke
- Diabetes
- Obstructive sleep apnoea

3%

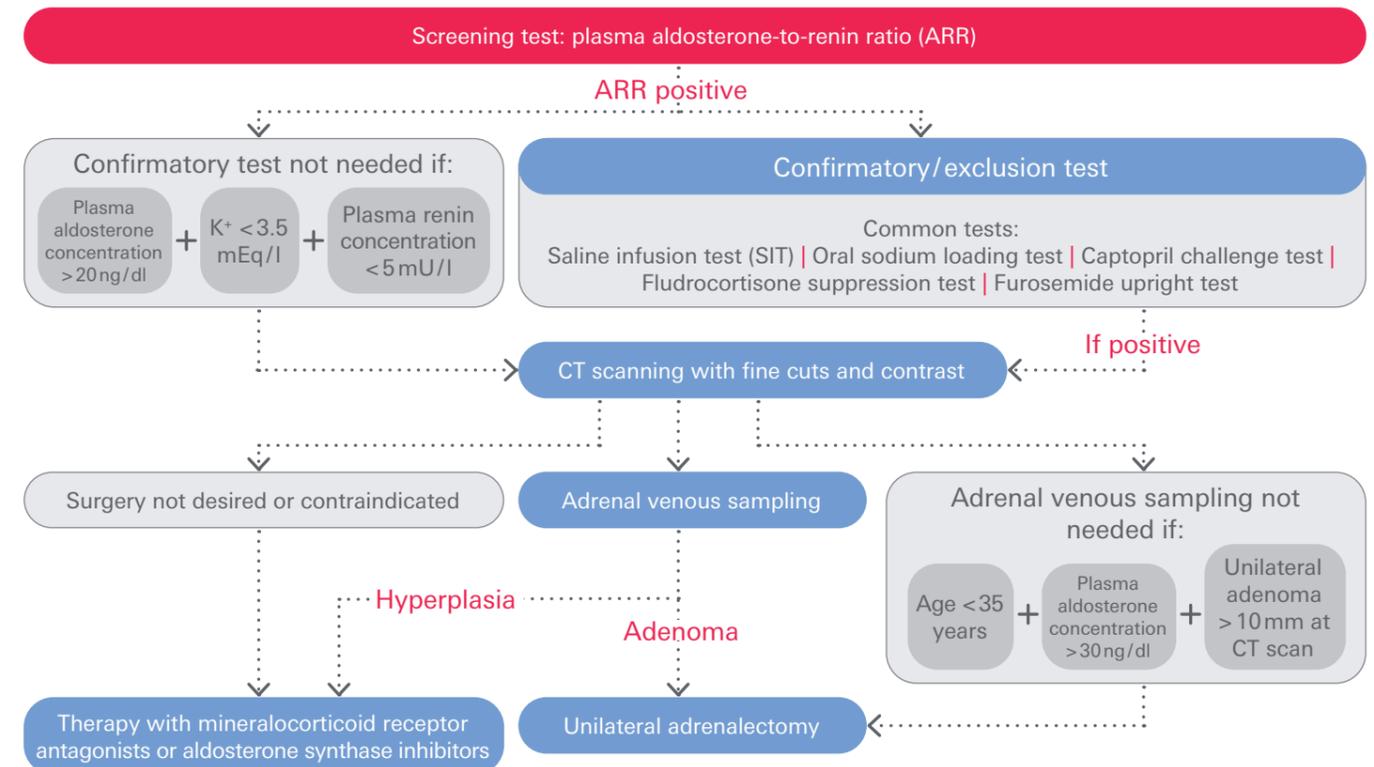
According to a study in Italy and Germany, general practitioners request renin and aldosterone measurements in only 3% of hypertensive patients before starting pharmacological treatment.⁷

Available assays

- IDS Aldosterone (IS-3300)**
For the determination of plasma aldosterone concentrations
- IDS Direct Renin (IS-3400)**
For the determination of plasma renin concentrations

Testing algorithm for PA³

adapted from the Endocrine Society guidelines



Precautions for a correct evaluation of ARR

- Withdrawal** of antihypertensive drugs interfering with the renin-angiotensin-aldosterone system (RAAS) if clinically feasible
- Diet:** liberal sodium intake after correction of hypokalemia
- Timing of blood sampling:** early to mid-morning
- Posture:** blood collection after 15–20 minutes in sitting position
- Handling of samples:** no storage at refrigerated temperatures (2–8°C)

Range of ARR cut-offs in PA diagnostics⁸

ARR	Number of studies	Cut-offs
(ng/dl)/(mU/l)	3	1.2–3.7
(ng/dl)/(ng/ml/h)	10	20–40

mU/l = plasma renin concentration (PRC)
ng/ml/h = plasma renin activity (PRA)

ARR cut-off using the IDS assays⁹

An ARR cut-off of **1.12 (ng/dl)/(mU/l)** using the IDS assays provides the following sensitivity and specificity in PA diagnostics:

- With RAAS-interfering drugs:** Sensitivity: 0.89, Specificity: 0.96
- Without RAAS-interfering drugs:** Sensitivity: 0.99, Specificity: 0.98

SIT cut-off for PA confirmation using the IDS assay^{9, 10}

A plasma aldosterone concentration of more than **5 ng/dl** after saline infusion is confirmation of PA.

Advantages

IDS Direct Renin and IDS Aldosterone



Increased precision



Results within 1 hour



Accuracy & consistency



Traceability and lot-to-lot consistency



Eco-friendly



No toxic, radioactive or harmful waste (no associated costs, no licences required)



Reduced costs



Single determination, fully automated



Clinical application



Validated cut-offs for the ARR and confirmatory test – application across labs

ChLIA test kits and calibrators

 Product	Product code	Sample type	Sample volume	Assay range
IDS Aldosterone	IS-3300	K ₂ /K ₃ EDTA plasma	200 µl	3.7–132.0 ng/dl
IDS Direct Renin	IS-3400	K ₂ /K ₃ EDTA plasma	190 µl	1.8–550 µIU/ml

Control sets

 Product	Product code	Product format	On-board stability
IDS Aldosterone Control Set	IS-3330	3 levels, 6 vials of 1 ml each (lyophilised)	4 hours
IDS Direct Renin Control Set	IS-3430	3 levels, 6 vials of 1 ml each	8 hours

Regulatory status and precise intended use of the products must be verified for the user's individual jurisdiction. Please contact your country representative for product availability and information.

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