Hormonaly · ACADEMY

POCKET GUIDE · FOR LICENSED CLINICIANS

Primary Aldosteronism

A spectrum, not a switch — screening, pitfalls, imaging, adrenal vein sampling, genetics and surgical cure

An evidence-graded pocket reference to primary aldosteronism: the continuum from subclinical renin-independent aldosterone production to overt hypokalemic disease, how to screen and confirm without falling into the common traps, how to read CT and adrenal vein sampling, cortisol cosecretion, familial forms, and when adrenalectomy cures.



Aldosterone · 360.4 g/mol

Fady Hannah-Shmouni, MD FRCPC
Endocrinologist and biochemical geneticist

First edition · 2026

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A reference for licensed clinicians. Educational content and a reference for clinical reasoning — not medical advice for any individual.

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Primary Aldosteronism — A Clinician's Pocket Guide: A Spectrum, Not a Switch.

First edition, 2026. Fady Hannah-Shmouni, MD FRCPC.

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DATA FREEZE

The evidence and guidance summarized here were checked against primary sources up to 8 November 2026. Guidelines, product labels and assay specifications change; check the current versions before acting on any statement.

INTENDED USE

This book is educational content for licensed clinicians. It is a reference for clinical reasoning and is not medical advice for any individual patient. Diagnostic thresholds are assay- and protocol-specific; doses quoted are attributed to labels, guidelines or trials and are not dosing recommendations. Decisions about testing, adrenal vein sampling, surgery or medication belong to the treating clinician with the full clinical picture.

CASES

Clinical cases are illustrative composites. They do not describe identifiable individuals.

CITATION

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How to use this book

How the chapters are built, what the evidence grades mean, and the limits of this reference.

HOW EACH CHAPTER IS BUILT

- A one-line statement of the clinical idea, then focused prose with inline citations numbered per chapter. Every reference carries its PubMed identifier.
- Evidence chips mark the kind of data behind the chapter: randomized trials, diagnostic-accuracy studies, cohorts, guidelines and consensus, genetic and molecular work, or expert opinion.
- A letter grade (B or C in this edition) rates the strength of evidence for the chapter's main clinical use. Narrative, case and reference chapters carry no single letter grade.
- KEY POINT panels carry the practical takeaway. CLINICAL PEARL panels carry practice tips. PITFALL panels flag diagnostic and therapeutic traps. PROTOCOL panels set out test procedures as published.

WHAT THE GRADES MEAN

GRADE	MEANING
A	Consistent randomized trials or meta-analyses for the stated use.
B	A single high-quality trial, lower-quality trials, or strong observational or diagnostic-accuracy data.
C	Limited data: mechanism plus small or uncontrolled studies.
D	Preclinical, anecdotal or expert opinion only.

THREE RULES THIS BOOK FOLLOWS

- **Primary aldosteronism is a spectrum.** Renin-independent aldosterone production runs from subclinical to overt disease, and

  lateralization runs from a single adenoma to diffuse bilateral disease. Thresholds are points on a continuum, not natural boundaries.

- **Every number is assay- and protocol-specific.** An aldosterone-to-renin ratio, a saline-infusion cut-off or an adrenal vein sampling index means something only for the assay, posture, timing and protocol in which it was validated.
- **Pitfalls are part of the method.** Drugs, potassium, sodium intake, sample handling, cortisol cosecretion and sampling technique change results. Each chapter lists the traps that apply at that step.

UNITS

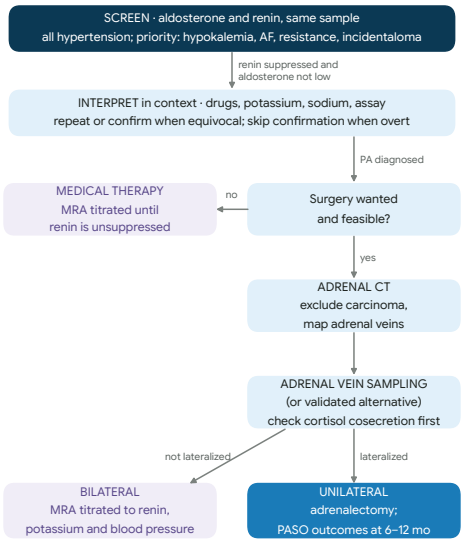
Aldosterone: 1 ng/dL = 27.7 pmol/L. Cortisol: 1 µg/dL = 27.6 nmol/L. Plasma renin activity (PRA) is reported in ng/mL/h. Direct renin concentration (DRC) is reported in mIU/L or ng/L. Conversion between PRA and DRC is assay-dependent and approximate (Appendix B).

Primary aldosteronism at a glance

The facts that change practice, with the chapter where each is developed.

FIGURE 0.1

The pathway in one page



Screening, interpretation, subtyping and treatment, with the decision points developed in Chapters 6–20. Simplified; thresholds and exceptions are in the chapters.

IT IS COMMON

When everyone undergoes sodium suppression testing, the adjusted prevalence of biochemically overt PA rises from 11.3% in normotension to 22.0% in resistant hypertension (Chapter 2).

IT IS RARELY SOUGHT

In 7.8 million people with hypertension in Taiwan, 4.4% were ever screened; in 2022 only 1.0% of those with resistant hypertension were tested (Chapter 6).

IT IS A SPECTRUM

Renin-independent aldosterone production runs from normotension to hypokalemic disease, and lateralization runs from a single adenoma to diffuse bilateral disease (Chapter 2).

IT HARMS BEYOND BLOOD PRESSURE

Against essential hypertension, PA carries higher odds of atrial fibrillation (OR 3.52), stroke (2.58) and heart failure (2.05) (Chapter 5).

SCREEN BROADLY, RENIN FIRST

The 2025 Endocrine Society guideline recommends testing renin and aldosterone in all people with hypertension. Suppressed renin is the gate (Chapters 6–7).

THRESHOLDS ARE ASSAY-SPECIFIC

With PRA, a positive ARR is >20 by immunoassay and >15 by LC-MS/MS (aldosterone ng/dL per ng/mL/h); other units differ (Chapter 7, Appendix B).

MOST ERRORS ARE PRE-ANALYTICAL

Drugs, potassium, sodium intake, posture, timing, estrogen with DRC and sample handling all shift the ratio (Chapter 8).

CT DOES NOT LATERALIZE

CT or MRI disagreed with AVS in 37.8% of 950 patients; acting on imaging alone risks wrong or unnecessary surgery (Chapters 10–12).

CHECK CORTISOL BEFORE AVS

About one in four patients with PA shows cortisol cosecretion (pooled 26.2%), which can distort AVS and cause adrenal insufficiency after surgery (Chapter 14).

SURGERY CURES BIOCHEMISTRY

After adrenalectomy for lateralized PA, 94% achieve complete biochemical success but 37% complete clinical success (PASO) (Chapter 19).

MEDICAL THERAPY HAS TARGETS

Normal potassium without supplements; renin rising to unsuppressed, commonly PRA ≥1 ng/mL/h (no validated threshold); blood pressure at goal. Excess risk tracks persistently suppressed renin (Chapter 20).

A NEW DRUG CLASS

Baxdrostat, an aldosterone synthase inhibitor, was approved in the US on 15 May 2026 for hypertension, not for PA. PA data are small and uncontrolled; monitor potassium (Chapter 20).

P PROLOGUE C

A history of primary aldosteronism: from Conn to the spectrum

Primary aldosteronism was described as a rare, hypokalemic tumor syndrome, and only later recognized as a common spectrum of renin-independent aldosterone production. Knowing how each assumption arose shows where today's pitfalls come from.

Historical · Case series · Genetic and molecular · Grade C

WHY HISTORY MATTERS AT THE BEDSIDE

Why should a clinician read history in a pocket guide? Because most of the diagnostic pitfalls in this book were inherited, not invented. Primary aldosteronism (PA) was first described in the mid-1950s. Diagnoses rose quickly at first, and then the condition was relegated for decades to the status of a "zebra" of hypertension, believed to explain only a small share of cases [1]. The early definition rested on a severe patient: hypokalemia, a large adenoma and cure by surgery. That definition shaped what was tested for, which thresholds were chosen and which patients were sent for subtyping. It took about 50 years of renin assays, screening studies, genetics and immunohistochemistry to replace it with the view used in this book. In that view PA is a spectrum of renin-independent aldosterone production, unilateral or bilateral, overt or mild, and in some patients accompanied by cortisol.

This prologue follows that change. It also sets out a question of priority that is often raised in Canadian teaching: was PA first discovered in Canada? The documented record answers that question, and it also shows that several Canadian groups made foundational contributions.