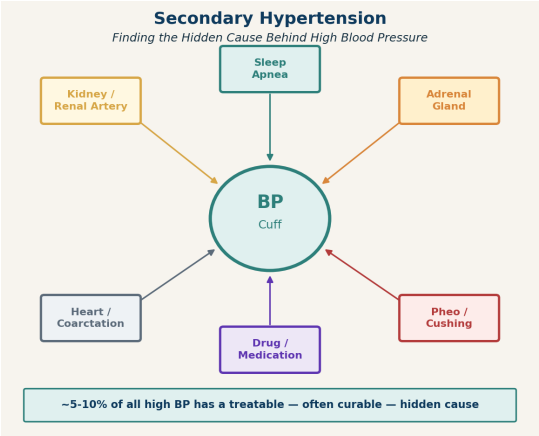
Secondary Hypertension

When High BP Has a Hidden, Often Curable Cause

About 1 in 10 to 1 in 20 people with high blood pressure have a specific medical cause. Finding it can mean better control — or a cure. This guide explains how.



Online: https://go.riasalimd.com/secondary-htn-guide

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Names & Terms You Will Hear

Term	Meaning
Secondary Hypertension	High BP with a specific, known cause. About 5 to 10% of all high BP cases have a secondary cause. Treating the cause can lower or even cure BP.
Primary (Essential) Hypertension	High BP with no single identifiable cause. The most common type (90 to 95% of cases). It is driven by genes, age, diet, and weight.
Primary Aldosteronism	The adrenal glands make too much aldosterone. This raises BP and lowers potassium. It is the most common hormonal cause. A blood test (aldosterone-to-renin ratio, or ARR) screens for it.
Renovascular Hypertension	High BP from a narrowed kidney artery. Two types: atherosclerotic (older patients) and FMD (younger women). Treated with medicine or angioplasty.
Fibromuscular Dysplasia (FMD)	A disease of the artery wall — not plaque. It beads the kidney and neck arteries. Most common in young women. Angioplasty (PTA) is often curative.
Pheochromocytoma	A rare adrenal tumor that releases adrenaline in bursts. Causes episodes of headache, sweating, and fast heart rate. Diagnosed with a blood test. Treated with surgery.
Aldosterone-to-Renin Ratio (ARR)	A blood test used to screen for primary aldosteronism. A high ratio (high aldosterone, low renin) is a positive screen and needs further testing.
STOP-BANG	An 8-question screen for sleep apnea. Score 5 to 8 = high risk. Ask your doctor about a sleep study. CPAP can lower BP by 5 to 10 mmHg.
Coarctation of the Aorta	A narrowing of the main heart artery. Causes high BP in the arms but low BP in the legs. Found in young people. Treated with balloon angioplasty or surgery.
Resistant Hypertension	BP at or above 130/80 on three full-dose drugs, including a water pill. A hidden cause is found in 30 to 40% of these cases. Every such patient should be screened.

Red Flags: When to Screen for a Secondary Cause

1	**Resistant HTN** BP ≥130/80 on 3 drugs at full dose, including a diuretic
2	**Early or late onset** New HTN before age 30 or sudden onset after age 55
3	**Abrupt worsening** Previously controlled BP suddenly spikes without cause
4	**Hypokalemia** Low potassium (unprovoked or from a diuretic) — think aldosteronism
5	**Incidental adrenal mass** Found on CT or MRI for another reason — needs hormonal workup
6	**Organ-system clues** Headache + sweating + fast HR; snoring; arm-leg BP difference
7	**Severe or malignant HTN** BP >180 systolic or end-organ damage (retina, kidney, brain)

Seven red flags that should prompt a secondary-cause workup. Any single flag — especially resistant HTN, onset before 30 or after 55, hypokalemia, or the episodic headache/sweating triad — is reason to screen. Source: ACC/AHA 2017 HTN Guideline; Viera & Neutze, AAFP 2010.

The key question in resistant or unusual HTN:
Is there a hidden cause?
A cause is found in 30 to 40% of resistant HTN patients. The screen is mostly blood tests and ultrasound. One procedure may replace four more pills.

Secondary Hypertension?

- **Secondary HTN** means high BP with a specific cause. That cause can often be treated — or even cured. This is different from primary HTN, where no single cause is found.
- **How common is it?** About 5 to 10% of all people with high BP have a secondary cause. In those with resistant HTN, a cause is found 30 to 40% of the time.
- **Primary aldosteronism is the top hormonal cause.** It shows up in up to 20% of resistant HTN. Potassium is normal in more than half of cases. The ARR blood test is the right screen — not just a potassium level.
- **Sleep apnea (OSA)** affects up to 80% of resistant HTN patients. CPAP alone can lower BP 5 to 10 mmHg. It is very common and very often undiagnosed.
- **Drug-induced HTN is often missed.** NSAIDs, decongestants, oral contraceptives, stimulants, and licorice all raise BP. A medicine review is the first step.
- **Finding the cause changes the plan.** Surgery for an aldosterone tumor can cure BP. Angioplasty for FMD is often curative. Stopping a drug can fix HTN on its own. More pills without finding the cause is the wrong answer.

Secondary Causes of High BP — Cause, Clue, Test, Treatment

Chronic Kidney Disease
Damaged kidneys hold sodium
eGFR + urine protein
Nephrology referral; diuretics

Renal Artery Stenosis
Atherosclerosis or FMD
Renal duplex ultrasound
Angioplasty / stenting

Primary Aldosteronism
Most common endocrine cause
Aldosterone-to-renin ratio (ARR)
Adrenalectomy or spironolactone

Pheochromocytoma / PGL
Episodic HA + sweating + HR
Plasma free metanephrines
Surgical resection

Cushing Syndrome
Cortisol excess; central obesity
24h urine cortisol / late PM salivary
Treat the cortisol source

Obstructive Sleep Apnea
Very common; often missed
STOP-BANG + sleep study
CPAP (drops BP 5-10 mmHg)

Drug-Induced HTN
NSAIDs, OCP, decongestants, stimulants
Full medication history
Stop or substitute the drug

Coarctation of Aorta
Younger pts; arm > leg BP
Arm-leg BP differential + echo/CTA
Balloon angioplasty or surgery

Thyroid / PTH Disease
Hypo- or hyperthyroidism; hypercalcemia
TSH; calcium + PTH
Treat thyroid / parathyroid cause

Nine secondary causes grouped by organ system, with the key clinical clue, diagnostic test, and first-line treatment for each. Primary aldosteronism and OSA are the two most common. Drug-induced HTN is frequently overlooked. Sources: ACC/AHA 2017 HTN Guideline; Endocrine Society Primary Aldosteronism Guideline 2016; AAFP Secondary HTN 2010.

Secondary HTN at a glance: cause, prevalence, best clue, and test

Cause	How common in resistant HTN	Key clue	First test
Primary aldosteronism	15–20%	Hypokalemia (but often absent)	Aldosterone-to-renin ratio (ARR)
Obstructive sleep apnea	Up to 80%	Snoring, daytime sleepiness, obesity	STOP-BANG + sleep study
Renal artery stenosis	1–5%	Renal bruit; age extremes; CKD	Renal duplex ultrasound

Cause	How common in resistant HTN	Key clue	First test
Chronic kidney disease	2–4%	Elevated creatinine; proteinuria	eGFR + urine albumin-to-creatinine
Pheochromocytoma	<1%	Episodes: HA + sweating + fast HR	Plasma free metanephrines
Cushing syndrome	<1%	Central obesity, stretch marks	24h urine cortisol or late salivary
Drug-induced	~3–5%	Review all meds/supplements	Medication history + trial stop
Coarctation	Rare in adults	Arm > leg BP; no femoral pulse	Arm-leg BP differential + echo
Thyroid / PTH	1–2%	Fatigue, weight change, Ca abnormal	TSH; calcium + PTH

Why It Matters

- **Secondary HTN is often missed.** Without testing, the cause goes untreated. BP stays high despite more and more drugs.
- **Primary aldosteronism harms the heart directly.** It causes more organ damage than regular HTN at the same BP level. Aldosterone scars the heart and kidneys beyond just raising pressure.
- **Pheochromocytoma is rare but very dangerous.** It can trigger a BP crisis, heart attack, or stroke. Any episode of headache + sweating + fast heart needs a blood test.
- **FMD is often overlooked.** Young women with new HTN before 40 may have FMD — not primary HTN. The wrong label delays a cure.
- **Stopping a drug can replace a pill.** If an NSAID or birth control pill is causing the HTN, stopping it works. No new medicine is needed.
- **Low potassium is a clue.** Unprovoked low potassium — or low potassium that gets worse on a water pill — needs an ARR test. A potassium supplement alone misses the real problem.
- **CPAP lowers BP around the clock.** Sleep apnea fires adrenaline surges overnight. CPAP stops this. It also makes other BP drugs work better.

Risk Factors

Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

Risk Factor	Why It Increases Risk
Resistant HTN (3+ drugs)	The top reason to look for a hidden cause. 30 to 40% of patients with resistant HTN have one. Aldosteronism and sleep apnea are most common.
Age < 30 or sudden onset > 55	Primary HTN rarely starts before 30 or spikes after 55. New HTN before 30 (especially in women) suggests FMD. Sudden onset after 55 suggests a narrowed kidney artery.
Spontaneous low potassium	Low potassium not caused by water pills points to aldosteronism. But normal potassium does NOT rule it out. The ARR blood test is still needed.
Adrenal mass on CT or MRI	Found when imaging is done for another reason. An adrenal nodule in a person with high BP needs hormone tests. Screen for aldosteronism and pheochromocytoma.
Episodes: headache + sweating + fast heart	The classic sign of a pheochromocytoma. Episodes may come on their own or be triggered by exercise or food. Even rare mild episodes need a plasma metanephrines blood test.
Arm BP much higher than leg BP	BP much higher in the arms than the legs, or no leg pulse, suggests coarctation of the aorta. Common in young people with new high BP.
Snoring / tired by day / overweight	This profile means high risk for sleep apnea. A STOP-BANG score of 5 to 8 should prompt a sleep study. OSA fires adrenaline surges overnight that raise BP all day.
On NSAIDs / birth control / decongestants	Birth control pills raise BP in 5% of users. NSAIDs block BP drugs. Decongestants squeeze blood vessels. Any one of these can be the only cause of the HTN.

Drug check — do you take any of these?
Ibuprofen (Advil), naproxen (Aleve), diclofenac — raise BP and block BP drugs.
Cold / sinus medicine (Sudafed, DayQuil) — squeeze blood vessels within hours.
Estrogen birth control pills — activate the renin system; raise BP in 5% of users.
Stimulants (ADHD drugs, energy drinks, cocaine) — fire the stress system; raise BP acutely.
Real licorice (candy or supplements) — mimics aldosterone; drops potassium.
Tell your doctor about every drug, vitamin, and supplement.

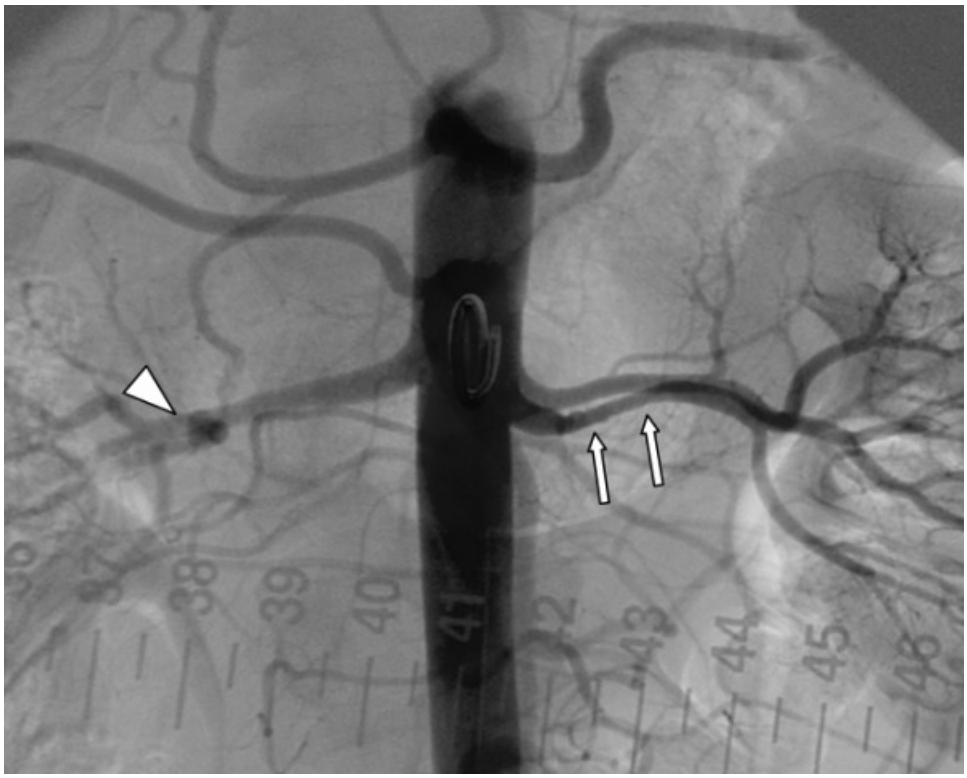
Treatment Options

- **Primary aldosteronism — single tumor:** Surgery (laparoscopic adrenalectomy) cures or greatly improves BP in up to 50% of patients. The rest still benefit from lower drug doses and less organ damage.
- **Primary aldosteronism — both glands:** Spironolactone or eplerenone daily controls BP and reverses aldosterone damage. Monitor potassium and kidney labs monthly at first.
- **Renal artery stenosis from plaque (atherosclerotic):** Start with medicines — ACE inhibitor or ARB plus a water pill. Add a stent only if BP stays high on 3 drugs or kidneys worsen. The CORAL trial (2014) showed medicine works as well as stenting in most stable patients.
- **FMD — kidney artery:** Balloon angioplasty (PTA) opens the beaded narrowings. No stent is left in place. It is often curative in young patients. Done at expert centers. Aspirin prevents clotting risk.
- **Pheochromocytoma:** Surgery removes the tumor. First take alpha-blocker drugs for 1 to 2 weeks before surgery. This blocks adrenaline surges during the operation. Never start a beta-blocker alone first — BP can spike dangerously.
- **Cushing syndrome:** Treat the cortisol source — brain tumor, adrenal tumor, or other mass. BP often improves after cortisol returns to normal. Surgery type depends on where the tumor is.
- **Sleep apnea (OSA):** CPAP is the main treatment. Even 4 hours per night lowers 24-hour BP by 5 to 10 mmHg. Weight loss, a mouthguard, or positional therapy are options if CPAP is not tolerated.
- **Drug-induced HTN:** Stop or switch the offending drug. For NSAIDs, use Tylenol for pain instead. For birth control pills, switch to progestin-only or non-hormonal. For decongestants, use saline rinse or steroid nasal spray instead.
- **Coarctation of the aorta:** Balloon angioplasty or surgery. BP often normalizes after repair. Lifelong follow-up is needed to watch for re-narrowing.
- **Thyroid disease:** Treating the thyroid fixes the BP. Low thyroid raises diastolic BP. High thyroid raises systolic BP. Thyroid medicine or anti-thyroid drugs usually normalize BP on their own.

Renovascular Hypertension: Two Very Different Causes

Atherosclerotic RAS	Fibromuscular Dysplasia (FMD)
Age: typically >55 years	Age: typically <50 years
Usually in older men who smoke	Mostly young women; no atherosclerosis
Narrowing at kidney artery opening	Mid-artery beading pattern on imaging
Part of systemic atherosclerosis	Also affects carotid/mesenteric arteries
Asymmetric kidney sizes on imaging	May cause pulsatile tinnitus or neck pain
Treat: optimize BP meds first;	Treat: percutaneous transluminal
stent only if BP uncontrolled	angioplasty (PTA) — often curative;
or kidney function worsening	antiplatelet therapy for dissection risk

Atherosclerotic RAS and FMD are both renovascular causes of HTN, but they affect different patients and need different treatments. FMD in a young woman is often curable with one angioplasty procedure. Sources: CORAL Trial 2014 (NEJM); Society for Vascular Surgery FMD guidelines.



A real renal angiogram showing fibromuscular dysplasia (FMD): the arrows point to the classic 'string-of-beads' narrowing, and the arrowhead marks a small saccular aneurysm on the opposite renal artery. This is the same beaded pattern described for FMD above — not plaque, but an artery-wall disease most often found in younger women. Image: Zeina AR, Vladimir W, Barmeir E. J Med Case Rep. 2007;1:58 (CC BY 2.0).

Primary Aldosteronism: The Most Common Missed Cause

- The adrenal glands make too much aldosterone. This hormone tells the kidneys to hold sodium and lose potassium. It raises BP directly and also scars the heart and kidneys.
- **Who to screen:** anyone with resistant HTN, low potassium, an adrenal mass, or new HTN before age 40. Normal potassium does NOT rule it out.
- **How to screen:** the ARR blood test (aldosterone-to-renin ratio). Done in the morning after sitting 5 to 10 minutes. Some drugs must be paused before the test — ask your doctor.
- **If positive:** a salt-loading test confirms the result. Then an adrenal CT looks for a single tumor vs both glands overworking. Adrenal vein sampling may be needed to find the exact source.
- **Single tumor (adenoma):** laparoscopic surgery cures or greatly improves BP in 50% of patients. The other 50% still need fewer drugs.
- **Both glands overactive:** spironolactone 25 to 100 mg daily. Or eplerenone if side effects occur. Check potassium and kidney labs monthly for 3 months.

Renovascular HTN: Atherosclerotic vs FMD

- Renovascular HTN happens when a kidney artery is narrowed. The kidney senses low flow. It fires up the renin system. BP rises. There are two very different types.
- **Atherosclerotic (plaque-related):** older patients, smokers, those with heart or leg artery disease. Plaque forms at the start of the renal artery. Stenting usually adds little over medicines (CORAL trial, 2014).
- **FMD (fibromuscular dysplasia):** not plaque — a wall disease. Causes a beaded look on imaging. Most common in women under 50. Also affects neck and gut arteries. May cause pulsatile sounds.
- FMD is treated with balloon angioplasty (PTA). No stent is left in place. Often curative. Re-narrowing is less common than with plaque-related stenting.
- Screen with renal duplex ultrasound — no radiation, non-invasive. CT or MR angiogram confirms the result if needed.
- ACE inhibitors and ARBs are the preferred drugs for both types. They block the renin system that drives the BP up. Check kidney function closely after starting.

Drug-Induced Hypertension: The Often-Missed Culprits

- Many drugs raise BP — and most patients do not connect the drug to the rise. A full medicine review is needed in every new or resistant HTN workup.
- **NSAIDs** (ibuprofen, naproxen, diclofenac, celecoxib): block kidney blood flow regulators. Raise BP 3 to 6 mmHg. Blunt ACE inhibitors, ARBs, and diuretics. Switch to Tylenol.
- **Estrogen birth control pills:** raise renin and angiotensin. Raise BP in about 5% of users. Risk is higher in women over 35 who smoke. Switch to progestin-only or non-hormonal options.
- **Decongestants** (pseudoephedrine, phenylephrine in cold medicines): constrict blood vessels directly. Can raise systolic BP 8 to 10 mmHg within hours. Use saline rinse or steroid nasal spray instead.
- **Stimulants** (ADHD drugs, cocaine, energy drinks): activate the stress nervous system. Raise BP both acutely and over time with regular use.
- **Real licorice** (candy or supplements with glycyrrhizin): mimics aldosterone. Raises BP and lowers potassium. Even moderate amounts can be significant.
- **Transplant drugs** (cyclosporine, tacrolimus) and some antidepressants (venlafaxine, duloxetine) also raise BP commonly.

Comfort Measures at Home (No Medication Needed)

These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Even after finding and treating the cause, lifestyle steps lower BP further. Cut sodium to under 1,500 mg per day.
- Lose weight if you are overweight. Even 5 to 10 lb helps. Weight loss lowers aldosterone, improves sleep apnea, and drops BP by 5 to 8 mmHg.
- Exercise 30 minutes most days. Walking, cycling, and swimming all count. It lowers systolic BP 5 to 8 mmHg.
- Stop ibuprofen and naproxen. Use Tylenol for pain instead. NSAIDs block BP drugs and diuretics within days.
- Limit alcohol to 1 drink per day for women, 2 for men. More than that raises BP and blunts your medicines.
- Do not stop any BP medicine without calling us first. Some drugs cause a dangerous BP spike when stopped suddenly.
- Use your CPAP every night. Even 4 hours per night helps. Consistent use gives the best BP benefit.

Risks, Benefits, and Alternatives

Every choice has trade-offs. Use this table to start the shared decision conversation.

Option	Risks	Benefits	Alternatives
ARR blood test (aldosteronism screen)	Some BP drugs must be held 4 to 6 weeks before the test. Talk to your doctor first. A false positive leads to more tests. Low burden: one blood draw.	Quick and low-cost. Catches the most common hormonal cause. A positive result leads to a workup. That workup can lead to a curative surgery or a highly effective drug.	Skip screening (risk missing aldosteronism). Repeat ARR after adjusting medicines. Or go straight to adrenal CT if suspicion is very high.
Adrenalectomy for aldosterone tumor	Surgical risks: bleeding, infection, gland failure. Laparoscopic surgery has less than 2% major complication rate. Recovery is 1 to 2 weeks. Some patients still need BP drugs long-term.	Cures or greatly improves BP in up to 50% of patients. Removes excess aldosterone — protects the heart and kidneys beyond just lowering the BP number.	Spironolactone or eplerenone daily for bilateral disease or patients who cannot have surgery. Controls BP well but does not remove the aldosterone harm as fully.
CPAP for sleep apnea	Mask discomfort. Dry mouth or stuffy nose (a humidifier helps). Takes 2 to 4 weeks to adjust. Must be used nightly for best results.	Lowers 24-hour BP by 5 to 10 mmHg. Improves alertness and mood. Stops the overnight adrenaline surges that keep BP high all day.	Oral appliance for mild to moderate sleep apnea. Weight loss. Positional therapy for sleep-position-related apnea. None work as well as CPAP for severe cases.
PTA (angioplasty) for FMD kidney artery	Catheter procedure with access-site risk. Small risk of artery tear (less than 2%). One-day hospital stay. Not all lesions are treatable.	Often curative for HTN in young FMD patients. No stent is left in place. Expert FMD centers have excellent outcomes. Avoids lifelong drugs.	Lifelong ACE inhibitor or ARB with close monitoring. Reasonable if anatomy is not suited to angioplasty.

Option	Risks	Benefits	Alternatives
Stopping the offending drug (NSAID or OCP)	Need a pain alternative to NSAIDs (use Tylenol). Need a contraception switch from OCPs. BP effect takes days to weeks to appear.	Can fully reverse drug-induced HTN at zero cost. Removes the cause directly. One of the only situations where HTN is entirely reversible.	Acetaminophen instead of NSAIDs. Progestin-only or non-hormonal contraception instead of OCPs. Add a BP drug if stopping the offending drug is not possible.

Common Misconceptions

Myth	Reality
"All high BP is from my genes or my diet."	Not always. In 5 to 10% of cases, a specific disease is driving the BP. Without finding it, you take more and more pills with less effect. Ask your doctor about a secondary-cause workup.
"My potassium is normal — so I do not have aldosteronism."	Wrong. More than 60% of patients with primary aldosteronism have normal potassium. Low potassium is a late sign. The ARR blood test is the right screen — not a potassium level.
"I snore, but sleep apnea does not raise BP."	It does. OSA is one of the top secondary causes of HTN. Low oxygen at night fires an adrenaline burst. This keeps BP high all day. CPAP alone lowers BP 5 to 10 points.
"Ibuprofen is safe — it is just OTC."	NSAIDs block the kidneys from clearing sodium. They also blunt the effect of every BP drug. Even a few days of use raises systolic BP by 5 to 6 mmHg. Use Tylenol for pain instead.
"FMD is very rare — I probably do not have it."	FMD is under-diagnosed, not rare. It is found in about 4% of women. Young women with new HTN before 40 should be screened. Angioplasty is often curative.
"A secondary-cause workup is a big deal."	The first screen is mostly blood tests and an ultrasound. ARR for aldosteronism. Plasma metanephrines for pheo. Renal duplex ultrasound for kidney artery disease. All outpatient. All low risk.
"Secondary HTN only happens to young people."	It happens at any age. Plaque-related kidney artery stenosis is most common after 55. Aldosteronism peaks in the 40s and 50s. Drug-induced HTN happens at any age. Ask if your BP is atypical.

Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

Where / What	What Can Happen
Heart	Missed secondary HTN causes thickened heart muscle (LVH), heart failure, and arrhythmias. Excess aldosterone also scars the heart directly — beyond just the pressure damage.
Kidney	High BP over years scars the kidney (nephrosclerosis). Renal artery stenosis cuts blood flow and speeds kidney failure. Finding these early can stop the decline.
Brain / Stroke	Uncontrolled secondary HTN raises stroke risk. Malignant HTN (very high BP with organ damage) can cause confusion, headache, and vision loss — a medical emergency.
Adrenal crisis after surgery	After adrenal surgery (for aldosteronism or Cushing), the remaining adrenal gland may work poorly for a while. Your team monitors this and prescribes steroid support.
Pheochromocytoma crisis	An untreated pheo can trigger a severe BP crisis, heart attack, stroke, or arrhythmia — often from stress, exercise, or food. It must be treated before any other surgery.
Aortic wall damage	Coarctation creates high-pressure turbulence in the aorta. Over time this weakens the aortic wall. Risk of aneurysm or aortic tear rises if coarctation is not fixed.

Points to Know

If you remember nothing else, remember these key points.

- Secondary HTN means BP with a known, treatable cause. Found in 5 to 10% of all HTN patients. Found in 30 to 40% of those with resistant HTN on 3 or more drugs.
- Primary aldosteronism is the top hormonal cause. Normal potassium does NOT rule it out. Use the ARR blood test — not a potassium level — to screen.
- Sleep apnea is the top secondary contributor overall. Use STOP-BANG to screen. CPAP alone lowers BP 5 to 10 mmHg. It also makes other BP drugs work better.
- Headache + sweating + fast heart rate in episodes = possible pheo. Get plasma free metanephrines tested. Missing this can be fatal.
- New HTN in a young woman before age 40: think FMD. Angioplasty (PTA) is often curative. No stent needed.
- NSAIDs, birth control pills, decongestants, stimulants, and licorice all raise BP. Review every drug before adding another. One of these may be the only cause.
- The workup is mostly blood tests and ultrasound — not surgery. It is outpatient and low risk. Ask if you have any red flags.
- Finding the cause can cure BP or cut pills in half. Do not accept uncontrolled BP on many drugs without this workup.

When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- **Call 911** for sudden severe headache, chest pain, shortness of breath, confusion, vision change, or one-sided weakness. These are signs of a BP emergency or stroke. Do not drive yourself.
- **Call 911 or go to the ER** for a sudden episode of severe headache + heavy sweating + racing heart. This is the classic pheo pattern. It needs urgent evaluation.
- **Call our office (727-943-5200)** if home BP stays above 150/90 on your medicines. Also call if you have muscle weakness, cramps, or irregular heartbeat — signs of low potassium.
- **Call us** if you start any new drug — even OTC — such as ibuprofen, naproxen, a decongestant, or a stimulant. These raise BP and blunt your BP drugs within days.
- **Call us** to request a workup if: BP stays high on 3 drugs; you got HTN before age 30; you snore heavily and feel tired by day; or imaging found an adrenal nodule.
- **See our companion guides:** Hypertension (htn-guide), Resistant HTN, Sleep Apnea, and HTN Emergencies.

Office: (727) 943-5200

Companion guides:
Hypertension (primary) · Resistant Hypertension · Obstructive Sleep Apnea · Hypertensive Emergencies

Trusted Resources

The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- Cleveland Clinic — Secondary Hypertension - Comprehensive patient overview of secondary HTN: causes, workup, and treatment written for the non-specialist.
- Mayo Clinic — Secondary Hypertension - Mayo Clinic overview covering symptoms, causes, and when to seek care.
- AHA — What Is Secondary Hypertension? - AHA plain-language overview of types of high blood pressure including secondary causes.
- AAFP — Secondary Causes of Hypertension (Viera & Neutze, 2010) - Evidence-based review for clinicians and informed patients: clues, tests, and treatment for each secondary cause.
- Endocrine Society — Primary Aldosteronism Guideline - Guideline on screening (ARR), confirmatory testing, and treatment of primary aldosteronism.
- NIH MedlinePlus — Renovascular Hypertension - Federal resource on renovascular HTN with patient-level explanation of renal artery stenosis.
- Society for Vascular Surgery — Fibromuscular Dysplasia - Patient overview of FMD: what it is, who it affects, and how it is treated with angioplasty.
- Endocrine Society — Pheochromocytoma / Paraganglioma Guideline - Guideline on diagnosis (plasma free metanephrines) and management of pheochromocytoma for informed patients.
- AHA — Sleep Apnea and Heart Disease - AHA resource on the link between sleep, OSA, and cardiovascular disease including high blood pressure.
- NIH MedlinePlus — High Blood Pressure - Federal patient resource with secondary HTN causes, measurement guidance, and free Spanish-language materials.

Sources Used to Build This Guide

Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- ACC/AHA 2017 High Blood Pressure Guideline *[Guideline]*
  Primary source for BP classification, definition of secondary HTN, and evaluation approach.
- Endocrine Society Clinical Practice Guideline — Primary Aldosteronism (2016) *[Guideline]*
  Defines screening criteria (ARR), diagnostic workup, and treatment of primary aldosteronism — the most common secondary cause.
- AHA Scientific Statement — Secondary Hypertension (Viera & Neutze, 2010, Am Fam Physician) *[Review Article]*
  Evidence-based review of secondary HTN causes, diagnostic clues, and targeted evaluation — used for patient-level framing.
- Cleveland Clinic — Secondary Hypertension *[Patient Resource]*
  Plain-language patient overview of secondary HTN used for framing and misconceptions section.
- Mayo Clinic — Secondary Hypertension *[Patient Resource]*
  Mayo Clinic patient overview and trusted-resource link for secondary HTN.
- AHA — Renovascular Hypertension and Fibromuscular Dysplasia *[Patient Resource]*
  AHA overview of renovascular causes including FMD for patient-level framing.
- Society for Vascular Surgery — Fibromuscular Dysplasia *[Patient Resource]*
  Patient-facing overview of FMD — used for renovascular subsection.
- Endocrine Society — Pheochromocytoma / Paraganglioma Clinical Practice Guideline (2014) *[Guideline]*
  Defines diagnostic approach (plasma free metanephrines) for pheochromocytoma/paraganglioma.
- NIH MedlinePlus — Renovascular Hypertension *[Patient Resource]*
  Federal plain-language resource on renovascular HTN — used for trusted resources section.
- American Academy of Family Physicians — Secondary Causes of High BP *[Review Article]*
  Prevalence estimates for each secondary cause and diagnostic yield — used for statistics in the guide.
- AHA — Obstructive Sleep Apnea and High Blood Pressure *[Patient Resource]*
  Patient-facing overview linking OSA and high BP — used for cross-link and trusted resources section.

About This Guide

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Reviewer note: Reviewed Cleveland Clinic Secondary Hypertension, Mayo Clinic, AAFP Secondary HTN (Viera & Neutze 2010), and ACC/AHA 2017 HTN Guideline. This guide adds: the 7-flag 'when to suspect' checklist; 9-cause grid with test and treatment per cause; FMD vs atherosclerotic RAS comparison; aldosteronism ARR framing for patients; and drug-induced HTN culprit list — absent or fragmented in standard patient pages.

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