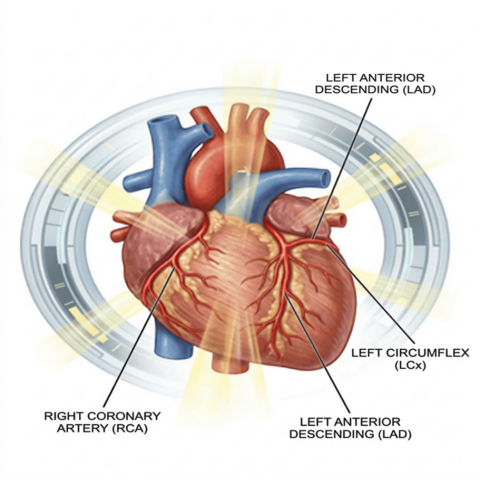
Understanding High Blood Pressure

What it is. Why it matters. What you can do.

Know your numbers. Move them. Keep them there.



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

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Names & Terms You Will Hear

Term	Meaning
Hypertension	The medical name we use in the chart.
High Blood Pressure	The everyday term for the same thing.
HTN	A common short form you may see in notes.
Systemic hypertension	High pressure in the body's main blood vessels. This is the usual kind.
Essential (primary) hypertension	No single cause. Many small factors add up. This is about 90% of cases.
Secondary hypertension	A specific cause we can find and treat, such as a kidney, hormone, or sleep problem.
Resistant hypertension	Blood pressure is still high on three medicines, one of which is a water pill.
Masked hypertension	Normal in the clinic but high at home.
White coat hypertension	High in the clinic but normal at home.
Hypertensive urgency	Very high pressure, often above 180/120, but with no organ damage.
Hypertensive emergency	Very high pressure plus signs of organ damage. Call 911.

What Is High Blood Pressure?

- Blood pressure is the force your blood puts on the walls of your arteries.
- There are two numbers. The top number (systolic) is when the heart squeezes. The bottom number (diastolic) is when it relaxes.
- High blood pressure means that force is too high too often. Over time it harms the arteries, heart, kidneys, brain, and eyes.
- About half of US adults have high blood pressure. Many do not know it, because high blood pressure usually has no symptoms.
- Most cases are 'essential' (also called 'primary'). There is no single cause. Many small factors add up.
- About 5 to 10% are 'secondary.' These have a cause we can find and treat, such as kidney narrowing, sleep apnea, or a hormone problem.

Blood Pressure Categories (2017 ACC/AHA)

Normal	Less than 120 and less than 80
Elevated	120-129 and less than 80
Stage 1	130-139 or 80-89
Stage 2	140 or higher or 90 or higher
Hypertensive Crisis	Higher than 180 and/or higher than 120

The five blood pressure categories from the 2017 ACC/AHA guideline. When the top and bottom numbers fall in different bands, the higher band wins.

Blood Pressure Categories at a Glance (2017 ACC/AHA)

Category	Top number (systolic)	Bottom number (diastolic)
Normal	Less than 120	and less than 80
Elevated	120 to 129	and less than 80
Stage 1	130 to 139	or 80 to 89
Stage 2	140 or higher	or 90 or higher
Hypertensive Crisis	Higher than 180	and/or higher than 120

Normal — Under 120/80

- Both numbers are in a healthy range: top under 120 and bottom under 80.
- No medicine is needed. The goal is to keep it here.
- Stay active, keep salt low, hold a healthy weight, and limit alcohol.
- Recheck about once a year, or sooner if you have other risks.

Elevated — 120 to 129 (top) and under 80 (bottom)

- The top number is creeping up while the bottom stays under 80.
- This is a warning stage, not yet high blood pressure.
- Lifestyle changes now can stop it from becoming Stage 1.
- Recheck in 3 to 6 months to see if the changes are working.

Stage 1 — 130 to 139 (top) or 80 to 89 (bottom)

- Either number being in this band counts as Stage 1.
- We start with lifestyle changes for everyone.
- We add a medicine if you also have diabetes, kidney disease, or a higher 10-year heart risk.
- Home readings help confirm this is real and not white coat.

Stage 2 — 140 or higher (top) or 90 or higher (bottom)

- Either number in this band counts as Stage 2.
- Most people need two medicines from different groups, plus lifestyle changes.
- Starting with two low doses works better than one high dose.
- We aim to reach the goal of under 130/80 within a few months.

Hypertensive Crisis — Over 180 and/or over 120

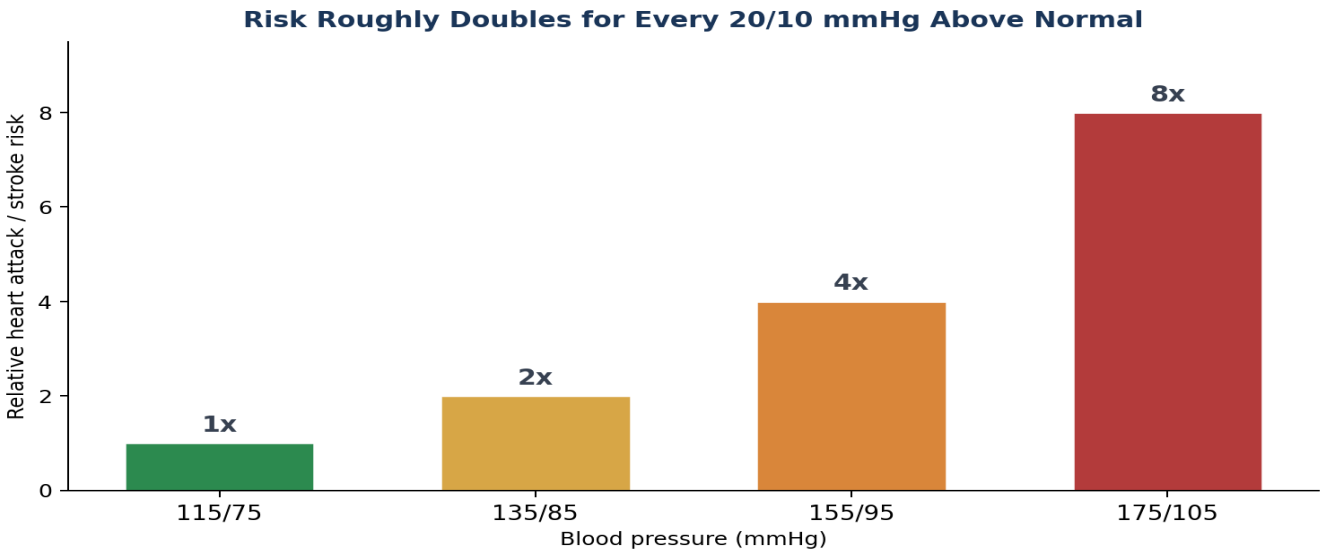
- This is the danger zone. Sit down and recheck in 5 minutes.
- If it stays this high AND you have symptoms (chest pain, trouble breathing, headache, vision change, weakness), call 911.
- If there are no symptoms but it stays this high, call us the same day.
- Do not wait. Very high pressure can damage organs fast.

At-a-Glance — The Five BP Categories

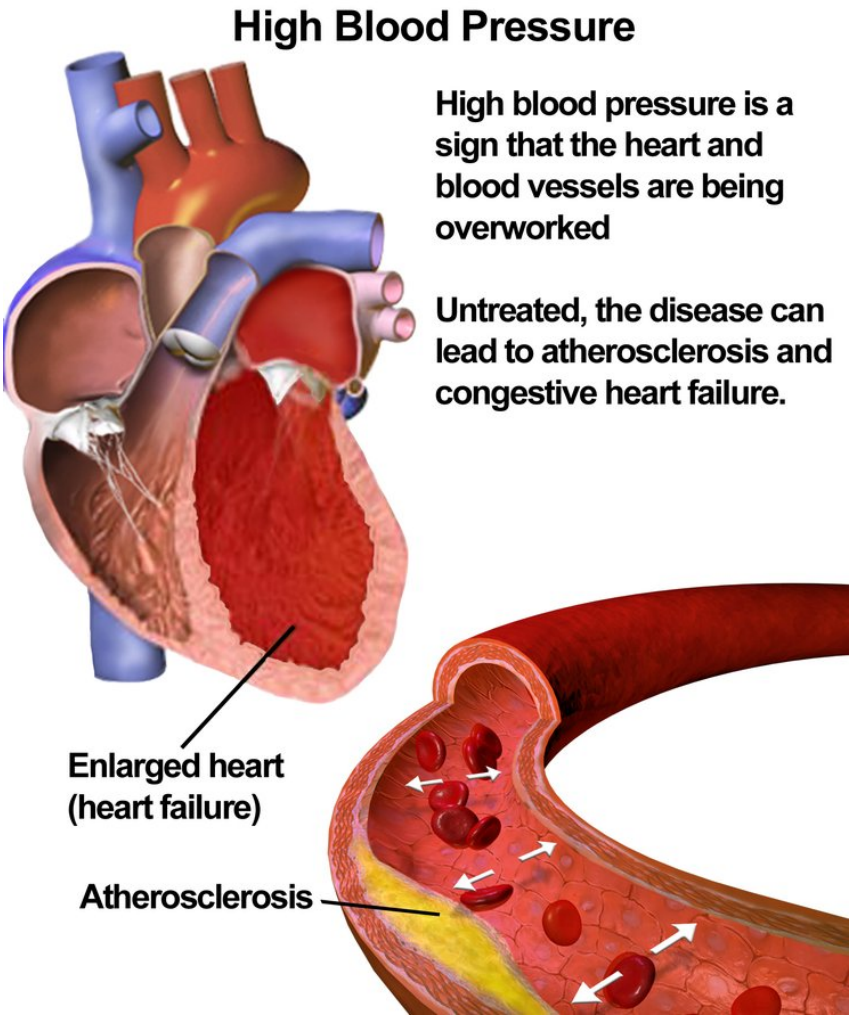
Normal	Elevated	Stage 1	Stage 2	Crisis
• Top under 120	• Top 120-129	• Top 130-139	• Top 140 or higher	• Top over 180
• Bottom under 80	• Bottom under 80	• or Bottom 80-89	• or Bottom 90 or higher	• and/or Bottom over 120
• Keep up healthy habits	• Lifestyle changes now	• Lifestyle + maybe a pill	• Usually two medicines	• Recheck in 5 minutes
• Recheck yearly	• Recheck in 3-6 months	• Based on your risk	• Plus lifestyle	• Symptoms? Call 911

Why It Matters

- Heart attack and stroke risk rises with every 20 mmHg above normal. The chart below shows risk roughly doubling at each step.
- Heart failure: untreated high blood pressure is the leading cause of heart failure worldwide.
- Kidney disease: high blood pressure is the second most common cause of needing dialysis.
- Memory loss: high blood pressure in midlife is one of the strongest predictors of vascular dementia later in life.
- Aortic disease: high blood pressure drives aortic tears and bulges. Both can be deadly when missed.
- Eye damage: changes in the back of the eye can be the first sign of long-standing high blood pressure.
- Almost all of this is preventable. Even a modest drop in blood pressure gives a large drop in risk (SPRINT, STEP).



Heart attack and stroke risk roughly doubles for every 20/10 mmHg above normal. Small drops in blood pressure give large drops in risk.



High blood pressure makes the heart and arteries work too hard. Over years the heart muscle thickens and enlarges, and fatty plaque builds up inside the artery wall. Image credit: BruceBlaus, Wikimedia Commons (CC BY 3.0).

When Your Doctor Looks for a Cause (Secondary Causes)

- About 5 to 10% of high blood pressure has a single cause we can find and treat. This is called secondary high blood pressure.
- We look harder for a cause when pressure is very high, starts before age 30, gets hard to control, or rises suddenly after years of being normal.
- Sleep apnea: pauses in breathing at night. The most common reversible cause. A sleep study finds it; a CPAP machine treats it.
- Too much aldosterone (primary aldosteronism): a hormone from the adrenal glands that holds onto salt. A blood test screens for it.
- Narrowing of a kidney artery (renal artery stenosis): less blood to a kidney makes it raise the pressure. An ultrasound or scan finds it.
- A rare adrenal tumor (pheochromocytoma): causes spells of pounding headache, sweating, and racing heart with very high pressure.
- Cushing syndrome: too much of the stress hormone cortisol, often with weight gain in the middle and a round face.
- Thyroid problems: both an overactive and an underactive thyroid can raise blood pressure.
- Coarctation of the aorta: a narrow spot in the body's main artery, usually found younger, with weaker pulses in the legs.
- Medicines and substances that raise pressure: NSAID pain pills (ibuprofen, naproxen), decongestants (pseudoephedrine), steroids, some birth control, licorice, and stimulants.

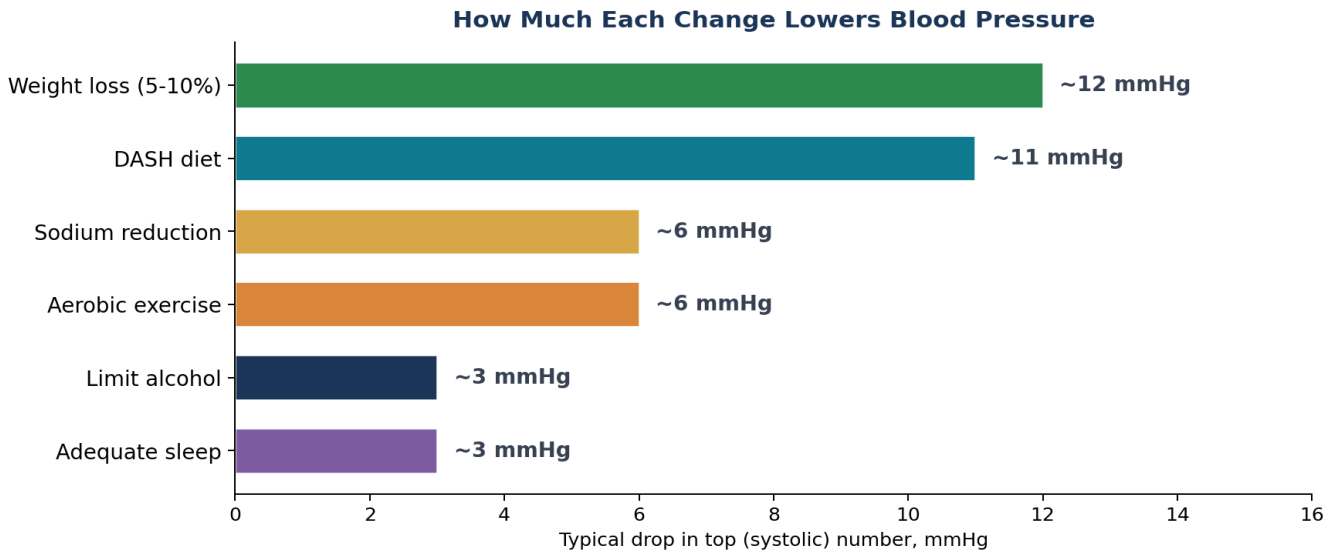
Risk Factors

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
Age	Arteries stiffen over time, so pressure tends to rise as we get older.
Family history	Blood pressure runs in families. Your genes affect how your body handles salt and fluid.
Too much salt	Extra sodium makes the body hold water, which raises pressure. Most salt is hidden in packaged food.
Excess weight	Carrying extra weight makes the heart work harder and raises pressure.
Too little activity	A sedentary life leads to stiffer vessels and higher pressure.
Heavy alcohol	More than 1 to 2 drinks a day raises blood pressure over time.
Sleep apnea	Pauses in breathing at night spike pressure and are a top reversible cause.
Chronic stress and poor sleep	Both keep the body in a 'high alert' state that raises pressure.

Treatment Options

- Start with the basics that help everyone: less salt, more activity, weight loss, better sleep, and less alcohol. The chart shows how much each one helps.
- Water pills (thiazide diuretics) such as hydrochlorothiazide, chlorthalidone, or indapamide remove extra salt and water. They are a common first choice.
- ACE inhibitors (lisinopril, ramipril) and ARBs (losartan, valsartan) relax blood vessels. They protect the kidneys, so they are first choice in diabetes and kidney disease.
- Calcium channel blockers (amlodipine, diltiazem) relax the artery muscle. They work well in older adults and are a common first choice.
- Most people need two medicines from different groups to reach goal. Combining low doses works better and has fewer side effects than one high dose.
- Other medicines (spironolactone, beta-blockers, others) are added for resistant cases or specific heart conditions.
- When blood pressure stays high on three or more medicines, we look for a hidden cause and may consider a procedure called renal denervation.
- The goal for most adults is below 130/80. We tailor the goal to your age, kidneys, and other conditions.



Typical drop in the top (systolic) number for each change. Combining changes (weight + DASH + less salt) adds up to the largest reduction.

Lifestyle Changes and How Much They Lower the Top Number

Change	Typical drop (systolic)	Source
Weight loss (5-10% of body weight)	5 to 20 mmHg	AHA/ACC 2017
DASH diet (low salt, vegetable-rich)	8 to 14 mmHg	DASH Trial
Less sodium (under 2,300 mg, ideally 1,500)	5 to 8 mmHg	INTERSALT
Aerobic exercise (30 min, most days)	4 to 9 mmHg	AHA Guideline
Limit alcohol (2 or fewer drinks a day)	2 to 4 mmHg	AHA
Adequate sleep (7+ hours)	2 to 4 mmHg	Sleep apnea data

The Main Blood Pressure Drug Groups — What They Do

Drug group	What it does	Common side effects
Thiazide / thiazide-like water pills (hydrochlorothiazide, chlorthalidone, indapamide)	Help the kidneys remove extra salt and water, which lowers the blood volume and the pressure.	Low potassium, low sodium, more urination, gout, a small rise in blood sugar.
ACE inhibitors (lisinopril, ramipril, enalapril)	Relax and widen blood vessels by blocking a hormone. They also protect the kidneys.	Dry cough, high potassium, rarely swelling of the lips or tongue (angioedema).
ARBs (losartan, valsartan, olmesartan)	Work like ACE inhibitors but in a different way. A good choice if an ACE inhibitor causes a cough.	High potassium. Rarely the swelling reaction. No dry cough.
Dihydropyridine calcium blockers (amlodipine, nifedipine)	Relax the muscle in the artery wall so vessels open up. Work well in older adults.	Ankle and foot swelling, flushing, headache.
Non-dihydropyridine calcium blockers (diltiazem, verapamil)	Relax vessels and also slow the heart rate. Useful when the heart races.	Slow heart rate, constipation (verapamil), should not mix with a beta-blocker without care.
Beta-blockers (metoprolol, carvedilol, bisoprolol)	Slow the heart and ease its workload. Mainly used when there is also heart disease or a fast heart.	Tiredness, slow pulse, cold hands, may mask low-blood-sugar warning signs.
MRAs (spironolactone, eplerenone)	Block a salt-holding hormone (aldosterone). The best add-on drug for resistant cases.	High potassium, breast tenderness in men (less with eplerenone).
Alpha-blockers (doxazosin, terazosin)	Relax vessels. Usually an add-on, not a first choice. Can also help an enlarged prostate.	Dizziness on standing, especially with the first dose.
Central agents / vasodilators (clonidine, hydralazine, minoxidil)	Older medicines kept in reserve for hard-to-control (resistant) cases.	Dry mouth, drowsiness, rebound high pressure if clonidine is stopped suddenly.

Who Should Be Careful With Which Drug

Drug group	Avoid or use caution if you...	Why
Thiazide water pills	Have low sodium, get dehydrated easily, faint or feel dizzy on standing (orthostatic hypotension), or feel unwell when low on fluid.	These pills pull off salt and water. In people prone to volume loss they can drop the sodium too low and worsen fainting and dizziness.
ACE inhibitors	Are pregnant or may become pregnant, have narrowing of both kidney arteries, or have very advanced kidney disease.	Can harm a baby in pregnancy and can push potassium too high. Never combine an ACE inhibitor with an ARB.
ARBs	Are pregnant or may become pregnant, have narrowing of both kidney arteries, or have very advanced kidney disease.	Same cautions as ACE inhibitors. Never combine an ARB with an ACE inhibitor.
Dihydropyridine calcium blockers (amlodipine)	Already have ankle swelling that bothers you.	They commonly cause ankle and foot swelling. The dose can be lowered or the drug changed.
Non-dihydropyridine calcium blockers (diltiazem, verapamil)	Have a slow heart rate or a weak heart pump.	They slow the heart further. They should not be mixed with a beta-blocker without close care.
Beta-blockers	Have asthma that is acting up or a very slow heart rate.	They can tighten the airways and slow the heart too much.
MRAs (spironolactone)	Have high potassium or poor kidney function.	They raise potassium. We check a blood test before and after starting.

Special Situations

- Resistant (refractory) high blood pressure: the pressure stays above goal even on three medicines, one of which is a water pill. We first make sure the readings, the salt intake, and the pill-taking are all on track, then look for a hidden cause, add spironolactone, and may consider renal denervation.
- Labile high blood pressure: the numbers swing widely up and down during the day. We look for triggers such as stress, caffeine, pain, or skipped doses, and we lean on home readings to see the true pattern.
- Supine high blood pressure with orthostatic hypotension: the pressure is high when lying down but drops too low when standing up, which causes dizziness or fainting. This high-lying, low-standing pattern is tricky.
- For that pattern we avoid long-acting pills at bedtime, raise the head of the bed, and treat the standing drops with care so we do not push the lying-down pressure even higher.
- Water pills are used with extra caution here, because pulling off salt and water can worsen the standing drops and the fainting.

A note on water pills (thiazides): They are a great first choice for many people, but they are not right for everyone. We avoid them or use them with care if your sodium runs low, you get dehydrated easily, or you faint or feel dizzy when you stand up (orthostatic hypotension). Pulling off too much salt and water can make these problems worse. Tell us if you have ever passed out, felt lightheaded on standing, or had a low sodium on a blood test.

Comfort Measures at Home (No Medication Needed)

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

- Use a validated upper-arm cuff at home. Wrist cuffs are not reliable.
- Sit quietly for 5 minutes first. No caffeine, exercise, or smoking for 30 minutes before.
- Sit with your back supported, feet flat on the floor, and your arm resting at heart level.
- Empty your bladder first. A full bladder can add about 10 mmHg.
- Take two readings one minute apart, both morning and evening, and average them.
- Track for at least a week before a visit. Bring the log or share it through your patient portal.
- Build the DASH plate: vegetables, fruit, whole grains, low-fat dairy, and lean protein. This alone can drop the top number 8 to 14 mmHg.

Risks, Benefits, and Alternatives

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

Option	Risks	Benefits	Alternatives
Lifestyle alone	May not be enough for Stage 2 or higher. Takes time to show effect.	No drug side effects. Helps the heart, mood, sleep, and weight too.	Add medicine if numbers do not reach goal in 3 months.
Medicine plus lifestyle	Possible side effects (cough, swelling, dizziness, low potassium). Cost.	Reaches goal for most people. Large drop in stroke and heart attack risk.	Lifestyle alone for mild cases. Add a device for resistant cases.
Renal denervation (resistant cases)	Procedure risks (vessel access, contrast dye). Not everyone responds.	FDA-approved for resistant high blood pressure. Durable drop for many (SPYRAL HTN-OFF MED PIVOTAL).	Add a 4th medicine (spironolactone) per PATHWAY-2. Refer to a specialist.

Common Misconceptions

Myth	Reality
I feel fine, so my blood pressure is OK.	High blood pressure almost never causes symptoms. For many people the first sign is a stroke or heart attack.
If the clinic reading is normal, mine is too.	White coat (high in clinic, normal at home) and masked (normal in clinic, high at home) both hide real risk. Home readings matter.
Salt only counts if I can taste it.	About 70% of the salt we eat is hidden in packaged food such as bread, cheese, soup, and sauces. The shaker is the smaller share.
Blood pressure pills are forever once you start.	Many people can lower the dose or stop with lasting weight loss, exercise, and less salt. We always reassess. Never stop on your own.
Home cuffs are not accurate.	A validated upper-arm cuff used correctly is more accurate than a single clinic reading. Wrist cuffs are the less reliable kind.
All blood pressure pills are the same.	The groups work very differently. The right one depends on your kidneys, age, diabetes, heart, and cost.
Treating the number does not really help.	SPRINT showed that aiming for 120 instead of 140 cut cardiovascular death by 27% in high-risk patients. Lower targets save lives.
Energy drinks and decongestants are safe with high blood pressure.	Both can raise pressure a lot. Avoid energy drinks and pseudoephedrine cold medicines. Ask the pharmacist for safer options.

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	Hypertensive heart disease: thickened heart muscle (left ventricular hypertrophy, or LVH), heart failure (both HFpEF and HFrEF), atrial fibrillation, and heart attack. We watch with an echo and use ACE inhibitors or ARBs to shrink the thickening.
Brain	Stroke (the most common), bleeding strokes with very high pressure, small vessel damage, and vascular dementia. Good control of the top number to 120 to 130 lowers the risk.
Kidney	Hypertensive nephrosclerosis and chronic kidney disease that can lead to dialysis. It is often silent until kidney function drops. ACE inhibitors and ARBs protect the kidneys.
Eye	Hypertensive retinopathy, graded by the Keith-Wagener-Barker scale from I (mild narrowing) to IV (swelling of the optic nerve, an emergency). A yearly eye exam catches it early.
Aorta and large vessels	Aortic bulges (aneurysm), aortic tears (dissection), and peripheral artery disease. Tight pressure control, a statin, and quitting smoking lower the risk.
Sexual function	Erectile dysfunction is often the first sign in men. Lifestyle and changing certain pills can help.

Points to Know

If you remember nothing else, remember these key points.

- Know your numbers. The goal for most adults is below 130/80.
- Take two home readings, morning and evening. Bring the log to every visit.
- Aim for under 2,300 mg of sodium a day, and ideally under 1,500. Read every label.
- A DASH-style diet drops the top number 8 to 14 mmHg.
- Losing 10 pounds usually drops blood pressure 5 to 10 mmHg.
- Avoid daily ibuprofen or naproxen for pain. They raise pressure. Acetaminophen is the safer choice.
- Take your medicine at the same time each day. A pill organizer doubles the odds you stay on track.
- Sleep apnea, alcohol, and stress are the three reversible drivers we miss most often.

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.

- Blood pressure above 180/120 with chest pain, shortness of breath, a severe headache, vision change, weakness, or confusion: call 911. This is an emergency.
- Blood pressure above 180/120 with no symptoms: sit and recheck in 5 minutes. If it is still that high after 15 minutes, call us the same day.
- A sudden severe headache, vision loss, or a drooping face: call 911.
- Fainting or passing out while on blood pressure medicine: call us. We may need to lower the dose.
- A lasting dry cough on an ACE inhibitor: call us. We can switch you to an ARB.
- Ankle swelling on amlodipine: call us. We have other options.
- A top number below 100 with dizziness: call us. The medicine may need adjusting.
- Blood in the urine, unexplained bleeding, or severe muscle pain on blood pressure medicine: call us.

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The 180/120 rule: If your reading is over 180/120, sit down and recheck in 5 minutes. If it is still that high AND you have any chest pain, trouble breathing, a bad headache, vision change, weakness, or confusion, call 911. If there are no symptoms but it stays that high after 15 minutes, call us the same day.

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.

- American Heart Association — High Blood Pressure - Plain-language overview from the AHA, including BP categories and lifestyle tips.
- CDC — High Blood Pressure - US prevalence and prevention information.
- Mayo Clinic — High Blood Pressure - Comprehensive overview with FAQs and treatment options.
- DASH Eating Plan (NHLBI) - Free, science-based DASH diet guide and meal plans.
- Million Hearts — Self-Measured BP - Step-by-step home blood pressure monitoring guide.

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.

- 2017 ACC/AHA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (Whelton et al., JACC 2018) *[Guideline]*
  Defines the stage 1 (≥130/80) and stage 2 (≥140/90) thresholds we color-code in the guide's BP staging table.
- SPRINT — A Randomized Trial of Intensive vs Standard Blood-Pressure Control (Wright et al., NEJM 2015; PMID 26551272) *[Clinical Trial]*
  Evidence basis for the guide's section explaining that a systolic target below 120 mmHg reduces cardiovascular events in high-risk non-diabetic adults.
- STEP — Trial of Intensive Blood-Pressure Control in Older Patients with Hypertension (Zhang et al., NEJM 2021; PMID 34491661) *[Clinical Trial]*
  Supports the guide's recommendation that intensive BP targets are safe and beneficial in adults aged 60–80 years.
- ACCORD-BP — Effects of Intensive Blood-Pressure Control in Type 2 Diabetes Mellitus (NEJM 2010; PMID 20228401) *[Clinical Trial]*
  Provides context for the guide's caveat that intensive systolic targets below 120 mmHg did not reduce major CV events in diabetic patients.
- ALLHAT — Major Outcomes in High-Risk Hypertensive Patients Randomized to ACE Inhibitor, CCB, or Thiazide (JAMA 2002; PMID 12479763) *[Clinical Trial]*
  Basis for the guide's first-line medication comparison showing chlorthalidone (thiazide) is as effective as ACE inhibitors and CCBs for most hypertensive adults.
- PATHWAY-2 — Spironolactone vs Placebo, Bisoprolol, and Doxazosin for Drug-Resistant Hypertension (Williams et al., Lancet 2015; PMID 26414968) *[Clinical Trial]*
  Supports the guide's explanation that spironolactone is the preferred fourth-line add-on agent when BP remains uncontrolled on three drugs.
- 2024 ESC Guidelines for the Management of Elevated Blood Pressure and Hypertension (McEvoy et al., Eur Heart J 2024) *[Guideline]*
  Provides the updated international context for the guide's treatment algorithm, including the single-pill combination strategy endorsed for most patients.
- AHA Scientific Statement: Measurement of Blood Pressure in Humans (Muntner et al., Hypertension 2019; PMID 30827125) *[Guideline]*
  Standards referenced in the guide's 'How to Measure Your Blood Pressure at Home' section for cuff size, positioning, and averaging technique.
- SPYRAL HTN-OFF MED PIVOTAL — Renal Denervation vs Sham in Unmedicated Hypertension (Böhm et al., Lancet 2020) *[Clinical Trial]*
  Provides background for the guide's sidebar on renal denervation as an emerging non-pharmacologic option for hypertension.

- INTERSALT — Sodium Excretion and Blood Pressure: Epidemiological Evidence (Stamler et al., BMJ 1988; PMID 3416162) *[Original Research]*
  Foundational evidence cited in the guide's lifestyle section linking dietary sodium reduction to meaningful population-level BP lowering.
- AHA — What Is High Blood Pressure? (heart.org) *[Patient Education]*
  Recommended as a patient take-home for a plain-language overview of hypertension symptoms, risk factors, and management.
- Mayo Clinic — High Blood Pressure (Hypertension) Overview (mayoclinic.org) *[Patient Education]*
  Cited in the guide's 'Learn More' section for patients wanting additional detail on lifestyle changes and medication side effects.
- CDC — High Blood Pressure (cdc.gov) *[Patient Education]*
  Source for the US hypertension prevalence statistics quoted in the guide's introduction.

About This Guide

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Reviewer note: Reviewed against AHA Heart.org, Mayo Clinic, and CDC high blood pressure pages. This guide adds color-coded 2017 ACC/AHA staging tied to home readings, a quantified lifestyle-impact chart in mmHg, complications nomenclature with named syndromes (LVH, Keith-Wagener-Barker grades, hypertensive nephrosclerosis), and renal denervation context.

Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.

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