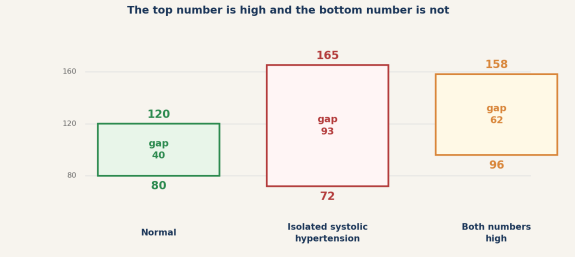
Understanding Isolated Systolic Hypertension

When the top number is high and the bottom number is not

This is the most common pattern of high blood pressure after about age 60. It is treatable, and treating it works.



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

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Last Updated: September 2026

Names & Terms You Will Hear

Term	Meaning
Isolated systolic hypertension (ISH)	A high top number with a bottom number that is normal or low.
Systolic pressure	The top number. The pressure while the heart is squeezing.
Diastolic pressure	The bottom number. The pressure while the heart is refilling between beats.
Pulse pressure	The gap between the two numbers. Top minus bottom.
Arterial stiffness	Loss of springiness in the large arteries, mainly the aorta.
Aorta	The main pipe leaving the heart. It is meant to stretch with each beat.
Wave reflection	The pressure wave bouncing back from smaller arteries. In a stiff system it returns too early.
Orthostatic	Related to standing up.

Call 911 for stroke warning signs. Think F.A.S.T.
Face drooping. **A**rm weakness. **S**peech trouble. **T**ime to call 911.
Also call 911 for chest pressure, sudden severe shortness of breath, or sudden tearing chest or back pain.
Stroke is the main risk that treating a high top number prevents. Note the time you were last normal and do not drive yourself.

What Is Isolated Systolic Hypertension?

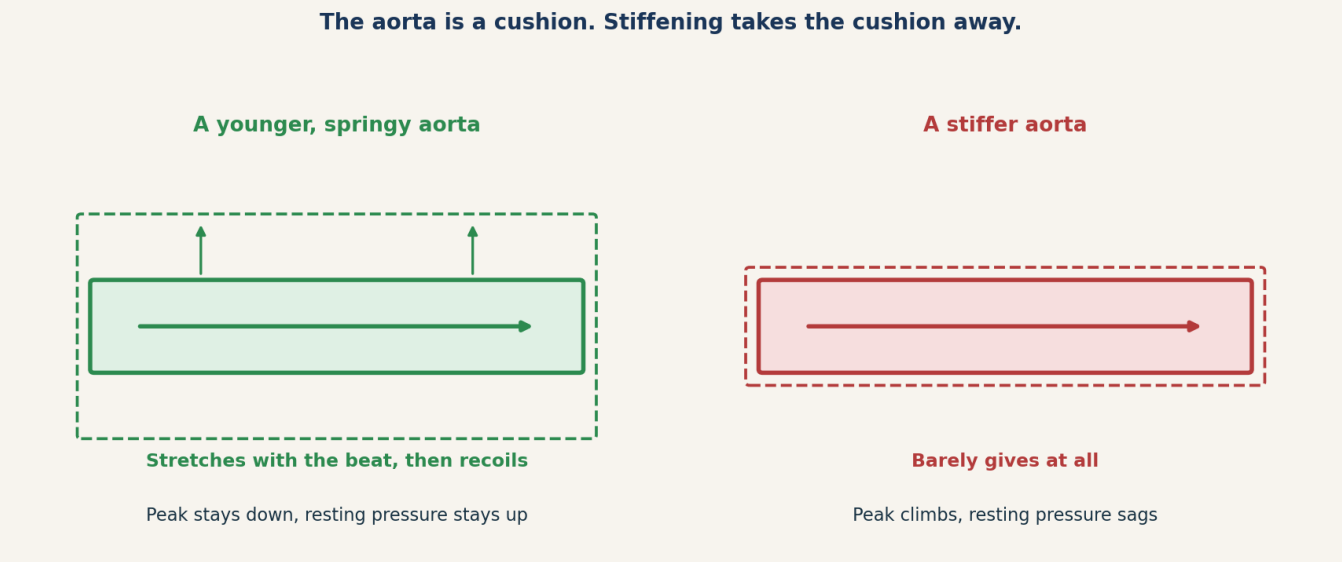
- A blood pressure reading has two numbers. The top is the pressure while the heart squeezes. The bottom is the pressure while the heart refills.
- Isolated systolic hypertension means the top number is high while the bottom number is normal or even low.
- It is the most common pattern of high blood pressure after about age 60.
- The usual cause is a stiffer aorta, not a heart that is pumping too hard.
- The gap between the two numbers is called the pulse pressure. In this condition the gap is wide.
- A normal gap is roughly 40. A gap of 60 or more is wide and deserves attention.
- This is real high blood pressure. Being common with age does not make it harmless.
- It can also show up in younger people, where it means something different. That is covered later in this guide.

What Your Two Numbers Can Show

Pattern	What it looks like	What it usually means
Normal	Top under 120, bottom under 80	Nothing to treat. Keep doing what you are doing.
Isolated systolic	Top 130 or higher, bottom under 80	The common pattern after 60. Usually a stiff aorta.
Both numbers high	Top 130 or higher, bottom 80 or higher	The more common pattern before about 50.
Isolated diastolic	Top under 130, bottom 80 or higher	Seen more in younger adults. Still needs treating.
Very wide gap	High top, bottom well under 60	Worth checking for a leaky aortic valve or a high output state.

Why It Matters

- A young aorta is springy. It stretches when the heart pumps, then recoils and keeps blood moving while the heart refills.
- That stretch and recoil is a cushion. It keeps the peak pressure down and holds the resting pressure up.
- When the aorta stiffens, the cushion is lost. The peak goes higher and the resting pressure sags. That is exactly a high top number with a low bottom number.
- The pressure wave that bounces back from smaller arteries also returns too early, which piles onto the peak instead of supporting the bottom number.
- The extra pulsing energy is pushed into the small, delicate vessels of the brain and kidneys.
- After about age 60, the top number predicts stroke and heart risk better than the bottom number does.
- Treating it works. In the SHEP trial, treatment cut strokes by 36 percent over 5 years.
- A wide gap between the numbers is itself a warning sign, not just a by-product.



Why only the top number rises. A springy aorta stretches with each beat and recoils between beats, which lowers the peak and holds up the resting pressure. A stiff aorta does neither, so the top number climbs and the bottom number sags.

Common is not the same as harmless.

Almost everyone's arteries stiffen with age, so this pattern is expected. That has led to a long-standing habit of shrugging at a high top number in an older person. The trials disagree. Treating it prevents strokes, heart failure and deaths, including in people over 80. Age is a reason to treat carefully and slowly. It is not a reason to skip treatment.

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
Getting older	The aorta gradually loses elastic fibers and gains stiffer ones. This is the single largest factor.
Years of untreated high blood pressure	Constant high pressure speeds up the stiffening.
Diabetes	High blood sugar stiffens artery walls faster.
Chronic kidney disease	Drives both pressure and calcium build-up in artery walls.
A high salt diet	Salt raises pressure and also promotes stiffening directly.
Smoking	Damages the artery lining and accelerates stiffening.
Too little physical activity	Regular aerobic activity helps keep arteries springy.
A leaky aortic valve	Blood falls back into the heart between beats. This drops the bottom number and widens the gap. It is a different problem with a different fix.
An overactive thyroid or severe anemia	The heart pumps a larger volume with each beat, which can widen the gap.
Sleep apnea	Repeated drops in oxygen at night raise pressure and stress the vessels.

Treatment Options

- The first question is whether the reading is real. High readings should be confirmed outside the office before starting treatment.
- Lifestyle steps come first and keep working alongside any medicine. Salt, weight, activity, alcohol and sleep all matter.
- When medicine is needed, thiazide-type water pills and calcium channel blockers are usually the first choices for this pattern.
- ACE inhibitors and ARBs are commonly added, especially with diabetes or kidney disease.
- In older adults we start low and increase slowly. The goal is a steady result, not a fast one.
- For most people the target is a top number under 130. Your own target depends on your age, other conditions, and how you tolerate treatment.
- We watch the bottom number as we lower the top one. If it falls very low, especially with known coronary disease, we slow down.
- Blood pressure should be checked standing as well as sitting, particularly in older adults and anyone who feels lightheaded.
- Home readings are the most useful thing most patients bring to a visit.
- Never stop a blood pressure medicine on your own. Tell us instead, and we will adjust it.

Why a Stiff Aorta Raises Only the Top Number

- The aorta is not just a pipe. It is an elastic reservoir that smooths a pulsing pump into steady flow.
- With each beat it balloons slightly, storing part of the stroke. Between beats it recoils and pushes that blood onward.
- That recoil is what keeps the bottom number up. Lose it and the bottom number falls.
- Storing part of the beat is what keeps the top number down. Lose it and the top number climbs.
- Stiffening also speeds up the pressure wave, so the reflected wave comes back during the squeeze instead of after it. It adds to the peak rather than supporting the trough.
- The result is one pattern with two halves: a higher top number and a lower bottom number, which is a wide pulse pressure.
- Over years this thickens the heart muscle. See our thickened heart muscle guide, and our stiff-heart failure guide for where it can lead.

When the Bottom Number Runs Low

- The heart muscle gets its own blood supply between beats, while it is relaxed. That is when the coronary arteries fill.
- The bottom number is the pressure during that filling time. If it falls very low, filling pressure falls with it.
- In people with narrowed coronary arteries, a very low bottom number has been linked to higher risk.
- There is good evidence this is about real blood flow, not a statistical quirk. After a heart attack, the extra risk at a low bottom number was seen in people whose artery had NOT been reopened, and disappeared in those whose artery had been.
- This does not mean a low bottom number is always dangerous. In a healthy person without coronary disease it is often just the stiff-aorta pattern.
- It also does not mean a low bottom number is a reason to leave a high top number untreated. In SPRINT, the benefit of lowering the top number did not appear to differ between people whose bottom number started around 61 and those who started higher.
- So a low bottom number tells us you are a higher-risk person who needs careful handling. It does not tell us to give up on the top number.
- It does mean we treat the top number thoughtfully rather than chasing it at any cost.
- Tell us if your bottom number regularly runs under 60, and especially if you also get chest pressure or unusual fatigue with activity.

When Treatment Is Too Much, and How We Ease Back

- Blood pressure treatment can be overdone. Knowing when is harder than it sounds, because the evidence points in two directions and it is worth seeing both.
- Start with what does NOT automatically mean too much. A drop in pressure on standing, measured in the office, is not by itself a reason to ease back. When trial data were pooled, intensive treatment slightly LOWERED the odds of that drop rather than causing it.
- In SPRINT, intensive treatment did lead to more reported fainting. It did not lead to more falls or more injurious falls.
- What does count is how you actually feel, and what actually happens to you. Dizziness that bothers you, a near-faint, or a fall are worth acting on even when the averages look reassuring.
- The signal is strongest if you have fallen before. In older adults with several conditions and a previous fall injury, blood pressure medicines were linked to roughly twice the risk of another serious fall.
- Kidney function is part of this too. The current guideline asks us to watch your kidney numbers as we treat, not only your pressure.
- Frailty changes the math. In frail older adults the benefit gets smaller and the harm gets larger, and most guidelines say very little about this group.
- The one guideline that names a trigger for cutting back uses the TOP number, not the bottom one. It suggests considering a step down when the top number sits under 120, or when there is a significant drop on standing.
- Easing back has been studied on purpose. In a trial of people aged 80 and older taking two or more blood pressure medicines, removing one kept the top number under 150 in 86 percent of them, compared with 88 percent who changed nothing. Two thirds stayed off the medicine that was removed.
- A review of all the stopping trials found the top number rose by about 10 points afterward, with little clear difference in deaths, hospital stays or strokes. That same review found no information at all about falls, which is the very thing people most want to know.
- How we do it: one medicine at a time, usually the one causing the most trouble, then recheck in a few weeks using your home readings.
- What we do not do: stop everything at once, or leave a high top number untreated because of age by itself.

When Blood Pressure Changes With Position

- Blood pressure is not one number. It moves with posture, time of day, and setting.
- Some people with a high lying-down pressure drop sharply on standing. That combination is its own problem, because the treatment for one worsens the other.
- We cover that pair in detail in our supine hypertension with orthostatic hypotension guide.
- Plain drops on standing are covered in our orthostatic hypotension guide.
- Orthostatic hypertension is the opposite: the pressure goes UP on standing. It is less familiar and often misunderstood.
- A large study followed more than 11,000 people for up to 30 years. A rise of 20 points or more on standing was not, by itself, linked to strokes, heart attacks or death.
- What was linked to all of those was a standing top number of 140 or higher. So the level you reach matters more than the size of the jump.
- This is why we measure standing pressure, and why home readings and sometimes a 24-hour monitor tell us more than any single office visit.

A High Top Number in a Younger Person

- This pattern also appears in people under 50, most often young men. It does not automatically mean the same thing.
- Between the heart and the arm, the pressure wave naturally amplifies. In some young people with very springy arteries this amplification is large.
- In those people the arm cuff reads high while the pressure at the heart and aorta is normal. Some researchers call this spurious hypertension.
- Others in this group have a fast heart rate and a large stroke volume from a high sympathetic drive. Anxiety at the visit can add to it.
- And some genuinely do have early arterial stiffening, which is not benign.
- So this is a mixed group, and the honest answer is that it needs sorting out rather than a reflex prescription.
- Long-term outcome data for young people with this pattern are still limited. That uncertainty is worth knowing about.
- Out-of-office readings help a great deal here. See our home blood pressure guide.

Causes Worth Ruling Out, Including a Leaky Aortic Valve

- Most isolated systolic hypertension is the stiff-aorta kind. A few cases are something else, and those have different fixes.
- A leaky aortic valve is the classic one. Blood falls back into the heart between beats, so the bottom number drops and the gap widens.
- Clues include a heart murmur, a pulse that feels unusually strong and bounding, and a gap that is very wide.
- If that is suspected, an echocardiogram answers it. See our aortic regurgitation guide.
- An overactive thyroid, severe anemia, or an abnormal connection between an artery and a vein can also widen the gap by increasing the volume pumped with each beat.
- Kidney, hormonal and sleep-related causes are worth considering too. Our secondary hypertension guide covers the findable causes.
- If pressure stays high on three or more medicines, that has its own pathway. See our resistant hypertension guide.

What Is Coming Next

- Most current medicines lower pressure by relaxing small arteries or removing fluid. None of them directly reverse a stiff aorta. That is the real gap.
- Measuring stiffness directly, rather than inferring it from the gap between the numbers, is becoming more practical. Pulse wave velocity is the main measure.
- Estimating the pressure at the aorta instead of at the arm may eventually sort out which younger patients truly need treatment.
- A catheter procedure that quiets overactive nerves to the kidney is now available for selected patients. See our renal denervation guide.
- New drug classes are arriving for hard-to-control pressure, including medicines that block aldosterone production. See our baxdrostat guide.
- Longer-acting treatments given every few months, rather than daily pills, are in trials. If they hold up they would help the single biggest problem in this field, which is taking medicine every day for decades.
- Cuffless and wearable monitors are improving, though they are not yet accurate enough to replace a validated cuff.
- None of this changes what helps today: confirm the reading, treat with proven medicines, watch the bottom number, and keep up the lifestyle work.

Comfort Measures at Home (No Medication Needed)

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

- Cut back on salt. Most of it comes from packaged and restaurant food, not the shaker.
- Eat more vegetables, fruit, beans and whole grains. Potassium-rich food helps offset sodium.
- Aim for regular aerobic activity. Brisk walking counts.
- Lose a modest amount of weight if you carry extra. Even a small loss lowers pressure.
- Keep alcohol light. More than a drink or two a day raises pressure.
- Get checked for sleep apnea if you snore heavily or wake unrefreshed.
- Take readings at home the right way. Sit quietly for 5 minutes, back supported, feet flat, arm at heart level.
- Bring your home log to every visit. A pattern is worth more than one number.
- Rise slowly from sitting or lying if you feel lightheaded.

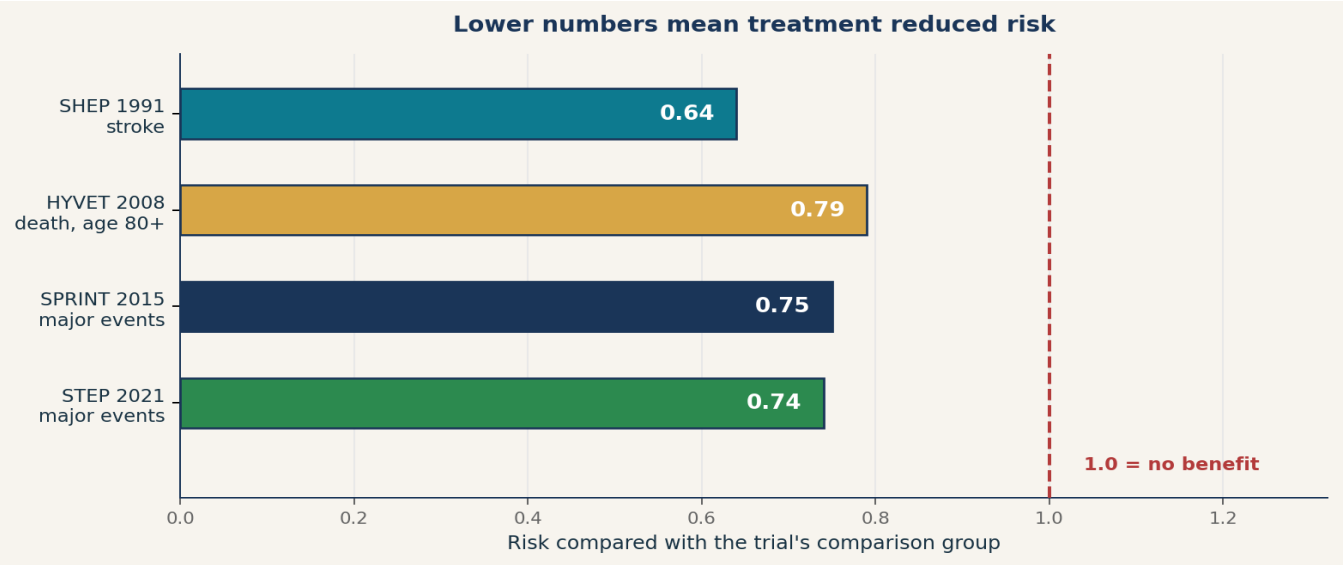
Reasons We Might Ease Back on Treatment

Signal	What it looks like	What we usually do
Symptoms on standing	Dizzy, unsteady, or nearly fainting after you rise	Check standing pressure and review timing and mix. Symptoms count for more than the drop alone
A fall	Any fall, with or without injury	Review every medicine that lowers pressure, especially if you have fallen before
A very low bottom number	Repeatedly under 60, or under 70 with coronary disease	Slow down on the top number and review the drug mix
Frailty or a long pill list	Weight loss, poor appetite, slower walking, many medicines	Aim for a gentler target and simplify the regimen
Lab changes	Kidney numbers drifting, or potassium or sodium off	Adjust or switch the medicine responsible
Feeling well at target	No symptoms and steady home readings	Keep going. This is what treatment working looks like

Risks, Benefits, and Alternatives

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

Option	Risks	Benefits	Alternatives
Lifestyle steps alone	May not be enough if the number is well above target. Delays benefit if used alone too long.	No medicine side effects. Helps weight, sugar, sleep and mood at the same time.	Adding a low-dose medicine while continuing the lifestyle work.
Thiazide-type water pill	Low potassium or sodium. More trips to the bathroom. Gout in some people.	Proven in this exact population. SHEP used one and cut strokes by 36 percent.	Calcium channel blocker, or an ACE inhibitor or ARB.
Calcium channel blocker	Ankle swelling. Constipation. Flushing.	Works well for stiff-artery high blood pressure and in older adults.	Water pill, or an ACE inhibitor or ARB.
ACE inhibitor or ARB	Cough with ACE inhibitors. Raised potassium. Kidney numbers need checking.	Useful when diabetes, kidney disease or heart failure are also present.	Water pill or calcium channel blocker as the main agent.
Aiming for a top number under 130	More lightheadedness, fainting, electrolyte and kidney effects. In SPRINT these were more common, though injurious falls were not.	Fewer heart attacks, strokes and deaths in trials including SPRINT and STEP.	A more relaxed target if you are frail, very old, or not tolerating treatment.
Accepting a higher target	Leaves more long-term risk of stroke, heart failure and kidney decline.	Reasonable when frailty, falls, or many other medicines make tight control unsafe.	A middle target, with slower steps and closer follow-up.



Four trials of treating high blood pressure in older adults. Each bar is the risk with treatment compared with the comparison group, so a bar below 1.0 means treatment helped. SHEP and HYVET compared drug treatment against placebo. SPRINT and STEP compared a lower target against a higher one.

Common Misconceptions

Myth	Reality
Only the bottom number really matters.	That was old teaching. After about age 60 the top number predicts stroke and heart attack better than the bottom number does.
My bottom number is low, so my blood pressure must be fine.	A low bottom number next to a high top number is the pattern of a stiff aorta. The wide gap is itself a risk marker.
A high top number is just normal aging.	It is common with age, but common is not the same as harmless. Treating it lowers stroke and heart failure risk.
I am too old for blood pressure treatment.	The HYVET trial studied people aged 80 and older. Treatment cut heart failure by 64 percent and death by 21 percent. The treated group actually had fewer serious adverse events than the placebo group.
Treating my blood pressure will make me fall.	Be honest about both halves. In SPRINT, intensive treatment caused more lightheadedness and fainting, but it did NOT cause more injurious falls. We watch for symptoms and adjust.
My pressure jumps when I stand, so something is badly wrong.	A large study followed people for up to 30 years and found the rise on standing was not linked to worse outcomes. What mattered was how high the standing pressure actually was.
A high top number in a young person means the same thing.	Not necessarily. In younger people it is a mixed group. In some the arm reading overstates the pressure at the heart. Others do have early stiffening. It needs sorting out, not assuming.
If my doctor lowers my dose, my treatment has failed.	Not at all. Easing back is a planned step when a dose is doing more harm than good. It has been studied deliberately. In one trial of people over 80, two thirds stayed off the medicine that was removed and their blood pressure control held.

Myth	Reality
If one pill did not work, nothing will.	Most people need more than one medicine. Combining low doses of two often works better with fewer side effects than a high dose of one.

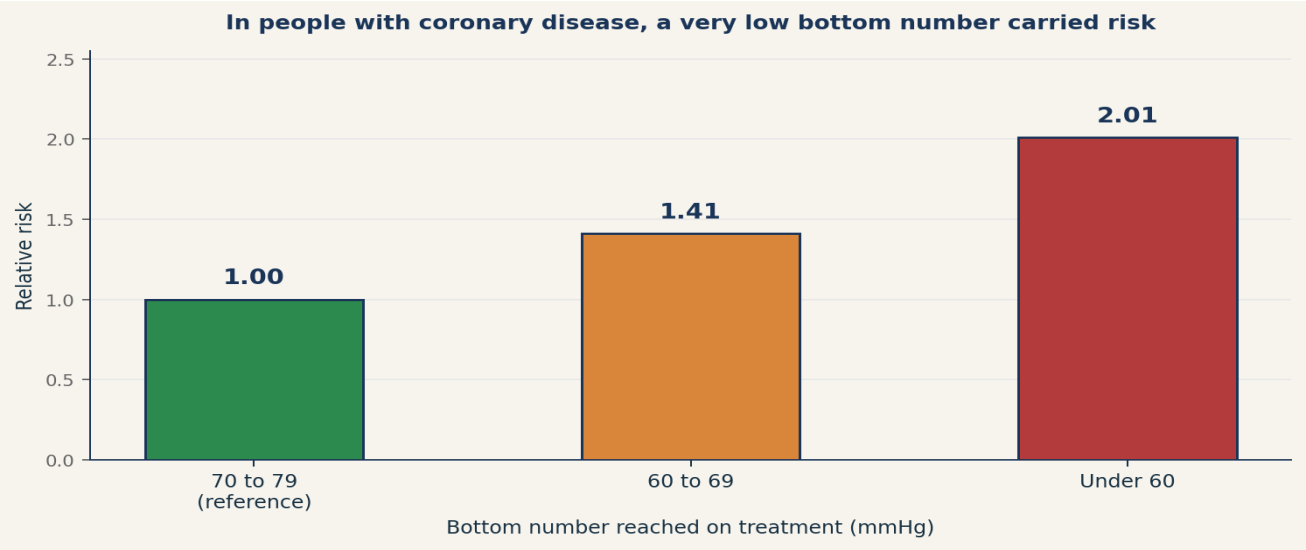
Blood Pressure Patterns That Depend on Position or Setting

Pattern	What happens	Why it matters
Orthostatic hypotension	Pressure drops when you stand up.	Causes dizziness and falls. Common in older adults and with some medicines.
Supine hypertension with orthostatic hypotension	High lying down, low standing up.	The hardest pair to manage. Treating one can worsen the other.
Orthostatic hypertension	Pressure rises when you stand up.	The rise itself was not linked to worse outcomes. A high standing number was.
White coat effect	High in the office, normal at home.	Why we confirm readings outside the office before treating.
Masked effect	Normal in the office, high at home.	Easy to miss. This is where home readings earn their keep.

Possible Complications

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

Where / What	What Can Happen
Stroke	The most consistent risk of an untreated high top number, and the one treatment reduces most clearly.
Heart attack	High pulsing pressure damages coronary arteries over time.
Heart failure with a stiff heart	The heart muscle thickens against the high pressure and stops relaxing well. This is a common end result of years of ISH.
Thickened heart muscle	The left ventricle grows heavier working against the higher pressure. This itself raises risk.
Kidney decline	The small vessels in the kidney take the extra pulsing energy poorly.
Memory and thinking changes	The brain's small vessels are also exposed to that pulsing energy. High pressure in midlife is linked to later cognitive decline.
Atrial fibrillation	Long-standing pressure stretches the upper chambers and promotes an irregular rhythm.
Aortic widening	A chronically stressed aorta can enlarge over years.



From the CLARIFY registry of 22,672 people with stable coronary disease treated for high blood pressure. Compared with a bottom number of 70 to 79, risk of heart attack, stroke or cardiovascular death was higher at 60 to 69 and higher still below 60. This is why we do not chase the top number without watching the bottom one.

How low is too low for the bottom number?

There is no agreed cutoff, and that is not a gap in this guide. The current US guideline states plainly that there is no cutoff for the bottom number during treatment, and asks us to watch your symptoms and your kidney function instead. European guidance does name a number, and advises against pushing the bottom number below 70.

Risk does rise as the bottom number falls. In people with coronary disease, compared with a bottom number of 70 to 79, risk was about 1.4 times higher at 60 to 69 and about 2 times higher below 60.

But that is not a reason to stop treating a high top number. In the randomized trials, lowering the top number helped in every group, including the people who started with the lowest bottom numbers.

Tell us if your bottom number is repeatedly below 60, or below 70 and you have coronary disease, especially with chest pressure or new shortness of breath when you exert yourself. Tell us about dizziness at any number.

Never stop or skip a dose on your own. Easing back is a decision we make together, one medicine at a time.

Points to Know

If you remember nothing else, remember these key points.

- Isolated systolic hypertension means a high top number with a normal or low bottom number. It is the usual pattern after about 60.
- The cause is a stiffer aorta that has lost its cushioning, not a heart that is squeezing too hard.
- Look at the gap between your numbers. A gap of 60 or more is wide.
- Treating it is proven to help. SHEP cut stroke by 36 percent, HYVET cut death by 21 percent in people over 80.
- The bottom number still counts. If it falls very low while we treat you, especially with coronary disease, tell us.
- Blood pressure should be checked standing too, not only sitting.
- A wide gap with a heart murmur should prompt a check for a leaky aortic valve, which is a different problem.
- In a younger person this pattern is a mixed bag and deserves a proper look before anyone starts a pill.

What to bring to your next visit.
A week of home readings, taken twice in the morning and twice in the evening, sitting quietly with your back supported and your arm at heart level. Write down both numbers every time, not just the top one. If you get lightheaded standing up, take one reading sitting and another after standing for one minute, and note that too. That single page is more useful to us than any one office reading.

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 face drooping, arm weakness, or trouble speaking. Note the time you were last normal.
- Call 911 for chest pressure or pain, or sudden severe shortness of breath.
- Call 911 for sudden tearing chest or back pain. This can signal a tear in the aorta.
- Call us the same day if you faint, or nearly faint, when standing up.
- Call us if you feel lightheaded or unsteady after a medicine change.
- Call us if you feel dizzy or unsteady standing up, even when your readings look good on paper.
- Call us after any fall, even one that did not injure you. It changes how we weigh your treatment.
- Call us if your home readings stay above your target for a week or more.
- Call us if your bottom number regularly drops below 60, especially if you have coronary disease.
- Call us before stopping or skipping any blood pressure medicine.
- Tell us if you notice a new murmur has been heard, or if your pulse feels unusually bounding.

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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: understanding blood pressure readings - What the two numbers mean, with the standard category chart.
- MedlinePlus: high blood pressure - Plain-language overview from the National Library of Medicine.
- National Heart, Lung, and Blood Institute: high blood pressure - Federal patient information on causes, testing and treatment.
- CDC: high blood pressure - Prevention and self-management basics, including home monitoring.

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.

- Chirinos JA, Segers P, Hughes T, Townsend R: Large-Artery Stiffness in Health and Disease. JACC State-of-the-Art Review (J Am Coll Cardiol 2019;74(9):1237-1263) *[Clinical]*
  The anchor reference for the physiology. A healthy aorta cushions each beat and limits pulsing. When it stiffens, that cushioning is lost. The paper links stiffening to isolated systolic hypertension. It also links it to pulsing energy pushed into the small vessels of organs like the brain and kidney. It states that large-artery stiffness independently predicts heart risk.
- SHEP Cooperative Research Group: Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension (JAMA 1991;265(24):3255-3264) *[Clinical Trial]*
  The trial that proved treating ISH works. 4,736 people aged 60 and up with systolic 160 to 219 and diastolic under 90. Mean age 72, mean pressure 170 over 77. Low-dose chlorthalidone first, atenolol second. Over 5 years stroke occurred in 5.2 per 100 treated versus 8.2 per 100 on placebo. That is a 36 percent reduction, or 30 strokes prevented per 1,000 people. Major cardiovascular events fell too, 55 fewer per 1,000.
- Beckett NS, Peters R, Fletcher AE, et al: Treatment of hypertension in patients 80 years of age or older (HYVET) (N Engl J Med 2008;358(18):1887-1898) *[Clinical Trial]*
  The evidence for treating people over 80. 3,845 patients, mean age 83.6, mean pressure 173 over 91, treated with indapamide with or without perindopril to a target of 150 over 80. Heart failure fell 64 percent. Death from any cause fell 21 percent. Stroke fell 30 percent, which just missed statistical significance. Notably the treated group had FEWER serious adverse events than placebo, 358 versus 448.
- SPRINT Research Group: A Randomized Trial of Intensive versus Standard Blood-Pressure Control (N Engl J Med 2015;373(22):2103-2116) *[Clinical Trial]*
  The trial behind lower systolic targets. 9,361 people at high cardiovascular risk without diabetes, randomized to a systolic target under 120 or under 140. Achieved 121.4 versus 136.2. Stopped early. Primary events 1.65 versus 2.19 percent per year, hazard ratio 0.75. Death from any cause hazard ratio 0.73. Used honestly here: the intensive group also had more low blood pressure, fainting, electrolyte problems and kidney injury, though NOT more injurious falls.
- Zhang W, Zhang S, Deng Y, et al: Trial of Intensive Blood-Pressure Control in Older Patients with Hypertension (STEP) (N Engl J Med 2021;385(14):1268-1279) *[Clinical Trial]*
  Tested lower targets specifically in older people. 8,511 Chinese patients aged 60 to 80, target 110 to under 130 versus 130 to under 150. Achieved 127.5 versus 135.3. Over a median 3.34 years the primary outcome occurred in 3.5 versus 4.6 percent, hazard ratio 0.74. Stroke hazard ratio 0.67. Supports the idea that age alone is not a reason to accept a high systolic number.
- Vidal-Petiot E, Ford I, Greenlaw N, et al: Cardiovascular event rates and mortality according to achieved systolic and diastolic blood pressure in patients with stable coronary artery disease (CLARIFY) (Lancet 2016;388(10056):2142-2152) *[Clinical Trial]*
  The main source for the low-diastolic concern. 22,672 people with stable coronary disease treated for high blood pressure, followed a median 5 years. Diastolic of 60 to 69 carried a hazard ratio of 1.41 for cardiovascular death, heart attack or stroke. Diastolic under 60 carried 2.01. Systolic under 120 carried 1.56. This is the evidence that the diastolic number is not just a spare part.

- Bohm M, Ferreira JP, Mahfoud F, et al: Myocardial reperfusion reverses the J-curve association of cardiovascular risk and diastolic blood pressure (EPHESUS analysis) (Eur Heart J 2020;41(17):1673-1683) *[Clinical Trial]*
  Explains WHY low diastolic matters, which makes the message usable instead of frightening. In 5,929 patients after a heart attack, a diastolic under 70 carried a death hazard ratio of 1.80 in those whose artery was NOT reopened. In those whose artery WAS reopened, that excess risk disappeared. This supports coronary filling pressure as the mechanism rather than a statistical artifact.
- Yano Y, Lloyd-Jones DM: Isolated Systolic Hypertension in Young and Middle-Aged Adults (Curr Hypertens Rep 2016;18(11):78) *[Clinical]*
  The source for ISH in people aged 50 and under. It is a mixed group, not one condition. Some have a high stroke volume, some have an already stiff aorta, some have both. The authors argue against treating it as one thing and in favor of sorting out which pattern a given person has before deciding on treatment.
- Saladini F, Palatini P: Isolated Systolic Hypertension in Young Individuals (High Blood Press Cardiovasc Prev 2017;24(2):133-139) *[Clinical]*
  Lays out the debate over ISH in the young, mostly young men. One view calls it spurious, caused by the normal amplification of the pulse wave between the chest and the arm, so the arm reading overstates the pressure at the heart. Another points to a high sympathetic drive with a fast heart rate and large stroke volume, often made worse by anxiety at the visit. Source for the honest statement that long-term outcome data here are limited.
- Dooley SW, Larbi Kwapong F, Col H, et al: Orthostatic and Standing Hypertension and Risk of Cardiovascular Disease, ARIC study (Hypertension 2024) *[Clinical Trial]*
  The key source for pressure that RISES on standing. 11,369 people followed up to 30 years. A rise of 20 points or more was NOT significantly linked to bad outcomes. A standing top number of 140 or more WAS linked to every endpoint. So the level reached matters, not the size of the jump. This corrects a common misunderstanding.
- Safar H, Chahwakilian A, Boudali Y, et al: Arterial stiffness, isolated systolic hypertension, and cardiovascular risk in the elderly (Am J Geriatr Cardiol 2006;15(3):178-182) *[Clinical]*
  Names the two drivers of ISH in older people: increased arterial stiffness and early return of reflected pressure waves. Also the source for the point that pulse pressure and pulse wave velocity are themselves risk markers, not just by-products of the systolic number.
- D'Elia L, Strazzullo P: Isolated systolic hypertension of the young and sodium intake (Minerva Med 2021;113(5):788-797) *[Clinical]*
  Connects salt to ISH in younger people. Excess sodium, often alongside extra weight and insulin resistance, can promote stiff arteries and endothelial dysfunction. Supports the lifestyle section with a mechanism rather than a generic instruction to eat less salt.
- Whelton PK, Carey RM, Aronow WS, et al: 2017 ACC/AHA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (Hypertension 2018;71(6):e13-e115). SUPERSEDED by the 2025 guideline. *[Guideline]*
  The prior US guideline. It has been formally retired and replaced. It is kept here for one reason. A full-text search confirms it set no lower limit for the bottom number. Its only low-diastolic caution is about severe aortic regurgitation, and it names no number. It is cited for that absence, not as current guidance.
- American Heart Association: Understanding Blood Pressure Readings *[Patient Education]*
  Patient-facing source for what the top and bottom numbers mean and for the standard category table. Used for plain-language framing and to keep the guide consistent with what patients read elsewhere.

- MedlinePlus: High Blood Pressure *[Patient Education]*
  Plain-language reference from the National Library of Medicine. Used for reading level calibration and as a trusted resource patients can follow up with.
- Beddhu S, Chertow GM, Cheung AK, et al: Influence of Baseline Diastolic Blood Pressure on Effects of Intensive Compared With Standard Blood Pressure Control (Circulation 2018;137(2):134-143) *[Clinical Trial]*
  The counterweight that keeps the low-diastolic message honest. This SPRINT analysis found baseline diastolic had a U-shaped link with risk, so a low bottom number does mark a higher-risk person. But the BENEFIT of lowering the top number did not differ by starting diastolic. In the lowest fifth, whose mean diastolic was 61, the hazard ratio was 0.78, close to the 0.74 in everyone else. This is why the guide does not tell patients that a low bottom number means treatment should stop.
- Sheppard JP, Burt J, Lown M, et al: Effect of Antihypertensive Medication Reduction vs Usual Care on Short-term Blood Pressure Control in Patients With Hypertension Aged 80 Years and Older (OPTIMISE) (JAMA 2020;323(20):2039-2051) *[Clinical Trial]*
  The main evidence that stepping treatment DOWN is a legitimate, studied option. 569 patients aged 80 and older, average age 84.8, on at least two blood pressure medicines, randomly assigned to remove one drug or continue usual care. At 12 weeks 86.4 percent of the reduction group still had a top number under 150, versus 87.7 percent of usual care. Two thirds stayed off the dropped medicine. Used with its limits stated: the average top number was 3.4 points higher, and the trial measured 12 weeks, not long-term outcomes.
- Kraut R, Lundby C, Babenko O, Kamal A, Sadowski CA: Antihypertensive medication in frail older adults, a narrative review through a deprescribing lens (Am Heart J Plus 2022;17:100166) *[Clinical]*
  Source for the frailty half of the back-off question. Frail older adults are underrepresented in the trials and in most guidelines. The review concludes there may be minimal cardiovascular benefit and significant harm from blood pressure medicine in this group, and that few guidelines say enough about it. It also argues for shared decision-making with the patient and family, which is the position this guide takes.
- Jones DW, Ferdinand KC, Taler SJ, et al: 2025 AHA/ACC Guideline for the Prevention, Detection, Evaluation and Management of High Blood Pressure in Adults (Circulation 2025;152(11):e114-e218) *[Guideline]*
  The CURRENT US guideline. It retires and replaces the 2017 version. Two points drive this guide. First, it says there is no cutoff for the bottom number during treatment. It asks us to watch symptoms and kidney function instead. Second, it notes that the lower systolic goal gave better outcomes in every group of starting diastolic, including the lowest. Note for future updates: five corrections have been published, so check any single figure.
- Mancia G, Kreutz R, Brunstrom M, et al: 2023 ESH Guidelines for the management of arterial hypertension (J Hypertens 2023;41(12):1874-2071) *[Guideline]*
  The European guideline. It is the one that names a number. It says the bottom number should not be pushed below 70 by drugs, to protect blood flow to organs. It also notes that many people with this condition already sit below 70. It is the only major guideline we found that names a trigger for cutting back. That trigger uses the TOP number: consider a step down if systolic is under 120, or if pressure drops on standing.
- Juraschek SP, Hu JR, Cluett JL, et al: Effects of Intensive Blood Pressure Treatment on Orthostatic Hypotension, a systematic review and individual participant-based meta-analysis (Ann Intern Med 2021;174(1):58-68) *[Clinical Trial]*
  The source that corrects a common assumption, including one this guide first got wrong. Pooled patient-level data found intensive treatment LOWERED the odds of a drop in pressure on standing. The odds ratio was 0.93. The authors conclude that such a drop should not be a reason to avoid or reduce treatment. This is why the guide now separates a measured drop from symptoms that actually bother you.
- Juraschek SP, Hu JR, Cluett JL, et al: Orthostatic Hypotension, Hypertension Treatment, and Cardiovascular Disease, an individual participant meta-analysis (JAMA 2023;330(15):1459-1471) *[Clinical Trial]*
  Nine trials and 29,235 people, followed a median of 4 years. Intensive treatment lowered heart events and

death whether or not a person had a drop on standing. Hazard ratio 0.83 with the drop, 0.81 without. There was no sign of harm even in those with low standing pressure. Supports treating the person, not the postural number.

- Gnjidic D, Langford AV, Jordan V, et al: Withdrawal of antihypertensive drugs in older people (Cochrane Database Syst Rev 2025;3(3):CD012572) *[Clinical]*
  The definitive summary of what happens when these medicines are stopped in older people. Six trials, 1,073 people. Stopping raised the top number by about 9.75 points and the bottom by about 3.5. There was little to no difference in death, hospital stays or stroke. Evidence on heart attack was very uncertain. The review found NO information on falls. The guide states that gap rather than hiding it.
- Tinetti ME, Han L, Lee DSH, et al: Antihypertensive medications and serious fall injuries in a nationally representative sample of older adults (JAMA Intern Med 2014;174(4):588-595) *[Clinical]*
  The observational counterweight to the trial data. In older adults with several chronic conditions, blood pressure medicines were linked to serious fall injuries. The signal was strongest in the 503 people who had already had a fall injury. There the adjusted hazard ratio reached 2.31. The tension with the trial findings is real. The guide shows both.

About This Guide

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Version: 2026-09-19

Reviewer note: We reviewed the blood pressure pages from the American Heart Association, MedlinePlus, and major clinic sites. They explain the two numbers well. What they do not explain is why only the top number rises, what a wide gap between the numbers means, how low the bottom number can safely go, or how the position-dependent patterns differ. This guide covers those.

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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