



[The Management of Elevated Blood Pressure in the Acute Care Setting: A Scientific Statement From the American Heart Association | Hypertension](#)

In summary, the current state of evidence suggests that treating asymptomatic elevated inpatient BP should generally be the exception, not the rule.

Outcomes of Treating Asymptomatic Elevated Inpatient BP

No randomized clinical trials have studied the treatment of asymptomatic elevated inpatient BP. However, multiple recent observational studies suggest that pharmacological treatment of asymptomatic elevated inpatient BP in the acute care setting, especially with intravenous medications, carries risks. One recent target trial emulation study by Anderson et al²⁴ examined intensive antihypertensive treatment strategies among adults ≥ 65 years of age who were hospitalized for noncardiac reasons in the national Veterans Affairs health system and had at least 2 elevated inpatient BP measurements in the first 48 hours of hospitalization. Patients who received ≥ 1 doses of new or intravenous antihypertensives medications in the first 48 hours of hospitalization were categorized as receiving intensive treatment. Patients not meeting this criterion were classified as receiving standard treatment. The primary outcome was a composite of mortality, acute kidney injury, stroke, troponin elevation, BNP (B-type natriuretic peptide) elevation, and transfer to the intensive care unit during the hospitalization. Intensive BP treatment occurred in 21% of eligible patients in the first 48 hours, and 18% of intensively treated patients received intravenous antihypertensives. Patients who received intensive BP treatment were more likely to experience the primary outcome (8.7% versus 6.9%; adjusted odds ratio, 1.28 [95% CI, 1.18–1.39]), and they were also more likely to experience a hypotensive episode (14.8% versus 14.0%; adjusted odds ratio, 1.22 [95% CI, 1.15–1.30]). Results were consistent across subgroups of age, frailty, home BP, and preexisting CVD.

In another study that included younger adults, Rastogi et al⁷ examined patients hospitalized for noncardiac



reasons who exhibited elevated inpatient BP in a 10-hospital health system. They compared patients whose highest BP during hospitalization was treated with new intravenous or oral antihypertensive medications with patients whose highest BP was not treated. Overall, 33% of the study population received intravenous or new oral antihypertensive medications, of which 26% included at least 1 intravenous medication. In the propensity score-matched analysis, patients who received ≥ 1 intravenous antihypertensive medications had significantly higher rates of the composite of acute kidney injury, myocardial infarction, or stroke (11% versus 8.2%).

Additional studies have focused on patients receiving PRN intravenous antihypertensives. Parenteral antihypertensive medications can lower BP abruptly, particularly in people with acute illness and impaired autoregulation. In a retrospective cohort health system study by Ghazi et al⁶ of 22 000 hospitalized adults who developed markedly elevated asymptomatic BP, patients treated with intravenous antihypertensives were 40% more likely to have a $\geq 30\%$ reduction in mean arterial pressure. In the same study population, intravenous antihypertensive treatment was associated with 60% greater risk of myocardial injury. In a single-center study, Mohandas et al²⁵ analyzed patients hospitalized for noncardiac indications, comparing patients who received PRN antihypertensives at any point during the hospitalization with patients who received scheduled antihypertensive medications. The investigators found that patients who received PRN antihypertensive medications (93% of which were intravenous) had a 2-fold higher risk of death, 24% higher risk of acute kidney injury, and 2-fold higher risk of abrupt BP lowering (defined as a $>25\%$ decrease in SBP within 1 hour of medication administration). However, the study had higher risk of confounding by indication because it did not consider the reason for admission, which included cardiovascular symptoms such as chest pain, heart failure, and shortness of breath. Another study in a large urban hospital found that 32.6% of patients receiving PRN intravenous antihypertensive medications experienced a drop in BP of $>25\%$ within 6 hours.²⁶ That same study found that administration of PRN intravenous antihypertensive medications was not routinely followed by intensification of oral medications and that PRN medications were often ordered for BP levels far below 180/100 mm Hg.²⁶ These data highlight the potential for serious adverse events attributable to large BP drops associated with intravenous antihypertensive medication administration.



Does The Evidence Support Any Situation to Treat Asymptomatic Elevated Inpatient BP?

Although most patients may not require treatment for asymptomatic elevated inpatient BP, it is plausible that benefit may outweigh risk in certain groups. Specifically, best practices for patients with persistent markedly elevated inpatient BP readings (ie, SBP/DBP >180/110-120 mm Hg) who have a history of high outpatient BPs may include initiating or intensifying antihypertensive medication during their admission. In addition, it may be reasonable to initiate or intensify antihypertensive medications in those with persistently high BP or persistently uncontrolled BP, as well as those at a high risk for or with a history of CVD. It is important to consider that a patient's BP may take several days to weeks to adjust to a medication change. Therefore, a typical inpatient stay is unlikely to be sufficient to fully assess the effect of a single medication change, and close outpatient follow-up is needed. In addition, the reason for hospitalization may affect decisions on treatment. For patients with resistant hypertension, a hospitalization for CVD might be an ideal time for a more comprehensive workup for secondary causes during their admission. However, for patients hospitalized for conditions unrelated to hypertension, a period of acute illness may be a less optimal time to intervene because patient priorities may be focused on the acute illness and their physiology not at baseline. We acknowledge that although the 2017 Hypertension Clinical Practice Guidelines define treatment goals for hypertensive emergencies, treatment goals for asymptomatic elevated BP are not as straightforward. If the decision is made to initiate antihypertensive medication for asymptomatic elevated inpatient BP, it is prudent to use guidance from the current 2017 Hypertension Clinical Practice Guidelines.

In summary, the current state of evidence suggests that treating asymptomatic elevated inpatient BP should generally be the exception, not the rule. Future studies are needed to further clarify whether there is clinical benefit for patients with markedly elevated hypertension without evidence of new or worsening target organ damage. Until then, adopting a cautious and patient-centered approach might be the most prudent strategy. If the choice to begin antihypertensive medication is made, using the 2017 Hypertension Clinical Practice Guidelines to guide the initial regimen in the acute care setting is reasonable.

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[Treatment and Outcomes of Inpatient Hypertension Among Adults With Noncardiac Admissions – PubMed](#) JAMA Intern Med. 2021 Mar 1;181(3):345-352.

Conclusions and relevance: In this cohort study, hypertension was common among medical inpatients, but antihypertensive treatment intensification was not. Intensification of therapy without signs of end-organ damage was associated with worse outcomes.

[Clinical Outcomes of Intensive Inpatient Blood Pressure Management in Hospitalized Older Adults – PubMed](#) JAMA Intern Med. 2023 Jul 1;183(7):715-723. doi: 10.1001/jamainternmed.2023.1667.

VA study with patient >> 65 years of age.

Conclusions and relevance: The study's findings indicate that among hospitalized older adults with elevated BPs, intensive pharmacologic antihypertensive treatment was associated with a greater risk of adverse events. These findings do not support the treatment of elevated inpatient BPs without evidence of end organ damage, and they highlight the need for randomized clinical trials of inpatient BP treatment targets.

[Projected Changes in Statin and Antihypertensive Therapy Eligibility With the AHA PREVENT Cardiovascular Risk Equations –](#)



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- [PREVENT Online Calculator – Professional Heart Daily | American Heart Association](#)
- [Predicting Risk of Cardiovascular Disease EVENTS \(PREVENT\)](#)
- **Conclusion and relevance:** By assigning lower ASCVD risk predictions, application of the PREVENT equations to existing treatment thresholds could reduce eligibility for statin and antihypertensive therapy among 15.8 million US adults.

References:

- [The Management of Elevated Blood Pressure in the Acute Care Setting: A Scientific Statement From the American Heart Association | Hypertension](#)
- [Clinical Outcomes of Intensive Inpatient Blood Pressure Management in Hospitalized Older Adults – PubMed](#)
- [Treatment and Outcomes of Inpatient Hypertension Among Adults With Noncardiac Admissions – PubMed](#)
- [2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines | Hypertension](#)
- [Projected Changes in Statin and Antihypertensive Therapy Eligibility With the AHA PREVENT Cardiovascular Risk Equations – PubMed](#)
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