



This is not the time to modify a HTN regimen

Intensifying hypertension regimens at discharge increases risk in older patients.

PRACTICE CHANGER

Avoid intensifying antihypertensive medication regimens at hospital discharge in older adults; making such changes increases the risk of serious adverse events (SAEs) and hospital readmission within 30 days without reducing the risk of serious cardiovascular events at 1 year post discharge.

STRENGTH OF RECOMMENDATION

B: Based on a large retrospective cohort study evaluating patient-oriented outcomes.¹

Anderson TS, Jing B, Auerbach A, et al. Clinical outcomes after intensifying antihypertensive medication regimens among older adults at hospital discharge. *JAMA Intern Med.* 2019;179:1528-1536.

ILLUSTRATIVE CASE

A 67-year-old man with hypertension that is well controlled on hydrochlorothiazide 25 mg po daily was admitted to the family medicine inpatient service for community-acquired pneumonia requiring antibiotic therapy and oxygen support. Despite improvement in his overall condition, his blood pressure was consistently > 160/90 mm Hg during his hospitalization. He was treated with lisinopril 10 mg po daily in addition to his home medications, which helped achieve recommended blood pressure goals.

Prior to discharge, his blood pressure was noted to be 108/62 mm Hg. He asks if it is necessary to continue this new blood pressure medicine, as his home blood pressure readings had been within the goal set by his primary care physician. Should you continue this new antihypertensive agent at discharge?

Outpatient antihypertensive medication regimens are commonly intensified at hospital discharge in response to transient short-term elevations in blood pressure during inpatient encounters for non-cardiac conditions.^{1,2} This is typically a reflexive response during a hospitalization, despite the unknown long-term, patient-oriented clinical outcomes. These short-term, in-hospital blood pressure elevations may be due to numerous temporary causes, such as stress/anxiety, a pain response, agitation, a medication adverse effect, or volume overload.³

The transition from inpatient to outpatient care is a high-risk period, especially for older adults, as functional status is generally worse at hospital discharge than prehospitalization baseline.⁴ To compound this problem, adverse drug reactions are a common cause of hospitalization for older adults. Changing blood pressure medications in response to acute physiologic changes during illness may contribute to patient harm. Although observational studies of adverse drug reactions related to blood pressure medications are numerous, researchers have only evaluated adverse drug reactions pertaining to hospital admissions.⁵⁻⁸ This study sought to evaluate the clinical outcomes associated with intensification of antihypertensive regimens at discharge among older adults.

STUDY SUMMARY

Increased risk of readmission, adverse events after intensification at discharge
This retrospective cohort study, which was

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This first study to address outcomes related to intensification of BP regimens at discharge found increased risk of readmission and serious adverse events within 30 days.

conducted across multiple Veterans Health Administration (VHA) hospitals, evaluated the association between intensifying blood pressure medication regimens at hospital discharge and sustained clinical outcomes in the outpatient setting. Study participants were community-dwelling adults (98% male) ages 65 years or older who had a prehospitalization diagnosis of hypertension and were admitted for pneumonia, urinary tract infection, or venous thromboembolism over a 3-year period (n = 4056).

Antihypertensive medication changes at discharge were evaluated using information pulled from VHA pharmacies, combined with clinical data merged from VHA and Medicare claims. Intensification was defined as either adding a new blood pressure medication or a dose increase of more than 20% on a previously prescribed antihypertensive medication. Patients were excluded if they were discharged with a secondary diagnosis that required modifications to a blood pressure medication (such as atrial fibrillation, acute coronary syndrome, or stroke), were hospitalized in the previous 30 days, were admitted from a skilled nursing facility, or received more than 20% of their care (including filling prescriptions) outside the VHA system.

Primary outcomes included hospital readmission or SAEs (falls, syncope, hypotension, serious electrolyte abnormalities, or acute kidney injury) within 30 days or having a cardiovascular event within 1 year of hospital discharge. Secondary outcomes included the change in systolic blood pressure (SBP) within 1 year after discharge. Propensity score matching was used as a balancing factor to create a matched-pairs cohort to compare those receiving blood pressure medication intensification at hospital discharge with those who did not.

Intensification of the blood pressure regimen at hospital discharge was associated with an increased risk in 30-day hospital readmission (hazard ratio [HR] = 1.23; 95% CI, 1.07–1.42; number needed to harm [NNH] = 27) and SAEs (HR = 1.41; 95% CI, 1.06–1.88; NNH = 63). There was no associated reduction in cardiovascular events (HR = 1.18; 95% CI, 0.99–1.40) or change in mean SBP within 1 year after hospital dis-

charge in those who received intensification vs those who did not (mean BP, 134.7 vs 134.4 mm Hg; difference-in-differences estimate = 0.2 mm Hg; 95% CI, –2.0 to 2.4 mm Hg).

WHAT'S NEW

First study on outcomes related to HTN med changes at hospital discharge

This well-designed, retrospective cohort study provides important clinical data to help guide inpatient blood pressure management decisions for patients with noncardiac conditions. No clinical trials up to that time had assessed patient-oriented outcomes when antihypertensive medication regimens were intensified at hospital discharge.

CAVEATS

Study population: Primarily older men with noncardiac conditions

Selected populations benefit from intensive blood pressure control based on specific risk factors and medical conditions. In patients at high risk for cardiovascular disease, without a history of stroke or diabetes, intensive blood pressure control (SBP < 120 mm Hg) improves cardiovascular outcomes and overall survival compared with standard therapy (SBP < 140 mm Hg).⁹ This retrospective cohort study involved mainly elderly male patients with noncardiac conditions. The study also excluded patients with a secondary diagnosis requiring modifications to an antihypertensive regimen, such as atrial fibrillation, acute coronary syndrome, or cerebrovascular accident. Thus, the findings may not be applicable to these patient populations.

CHALLENGES TO IMPLEMENTATION

Clinicians will need to address individual needs

Physicians have to balance various antihypertensive management strategies, as competing medical specialty society guidelines recommend differing targets for optimal blood pressure control. Given the concern for medicolegal liability and potential harms of therapeutic inertia, inpatient physicians must consider whether hospitalization is the



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best time to alter medications for long-term outpatient blood pressure control. Finally, the decision to leave blood pressure management to outpatient physicians assumes the patient has a continuity relationship with a primary care medical home. **JFP**

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