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#### ORIGINAL INVESTIGATION

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## Systolic Blood Pressure and Outcomes in Patients With Heart Failure With Reduced Ejection Fraction

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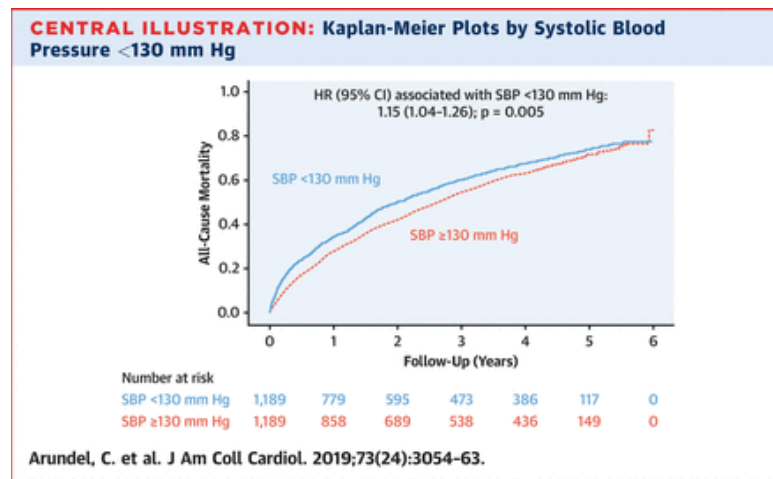
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## Abstract

**Background** National guidelines recommend that systolic blood pressure (SBP) in patients with heart failure with reduced ejection fraction (HFrEF) and hypertension be maintained below 130 mm Hg.

**Objectives** This study sought to determine associations of SBP <130 mm Hg with outcomes in patients with HFrEF.

**Methods** Of the 25,345 patients in the Medicare-linked OPTIMIZE-HF registry, 10,535 had an ejection fraction (EF) ≤40%. Of these, 5,615 had stable SBP (≤20 mm Hg admission to discharge variation), and 3,805 (68%) had a discharge SBP <130 mm Hg. Propensity scores for SBP <130 mm Hg, estimated for each of the 5,615 patients, were used to assemble a matched cohort of 1,189 pairs of patients with SBP <130 versus ≥130 mm Hg, balanced on 58 baseline characteristics (mean age 76 years; mean EF 28%, 45% women, 13% African American). This process was repeated in 3,946 patients, after excluding 1,669 patients (30% of 5,615) with a discharge SBP <110 mm Hg and assembled a second matched balanced cohort of 1,099 pairs of patients with SBP 110 to 129 mm Hg versus ≥130 mm Hg.

**Results** Thirty-day all-cause mortality occurred in 7% and 4% of matched patients with SBP <130 mm Hg versus ≥130 mm Hg, respectively (hazard ratio [HR]: 1.76; 95% confidence interval [CI]: 1.24 to 2.48; p = 0.001). HRs (95% CIs) for all-cause mortality, all-cause readmission, and HF readmission at 1 year, associated with SBP <130 mm Hg, were 1.32 (1.15 to 1.53; p < 0.001), 1.11 (1.01 to 1.23; p = 0.030), and 1.24 (1.09 to 1.42; p = 0.001), respectively. HRs (95% CIs) for 30-day and 1-year all-cause mortality associated with SBP 110 to 129 mm Hg (vs. ≥130 mm Hg) were 1.50 (1.03 to 2.19; p = 0.035), and 1.19 (1.02 to 1.39; p = 0.029), respectively.

**Conclusions** Among hospitalized older patients with HFrEF, SBP <130 mm Hg is associated with poor outcomes. This association persisted when the analyses were repeated after excluding patients with SBP <110 mm Hg. There is an urgent need for randomized controlled trials to evaluate optimal SBP reduction goals in patients with HFrEF.

## Key Words

heart failure   outcomes   systolic blood pressure

## Footnotes

↵\* Drs. Arundel and Lam contributed equally to this work.

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