

Abstract for Health Partners Hypertension Program

Circ Cardiovasc Qual Outcomes. 2012; 5: A7

Outcomes at Six Months of a Randomized Trial of Home **Blood Pressure Telemonitoring with Pharmacist Case Management**

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Background: Patients with high blood pressure (BP) visit a physician on average 4 times per year, though fewer than half achieve BP control. Practical, effective, and sustainable models are needed to improve BP management.

Aims: Hyperlink is a clinic-randomized trial testing an intervention that combines home BP telemonitoring with pharmacist case management in patients with uncontrolled hypertension.

Methods: We enrolled 450 patients with uncontrolled BP from 16 primary care clinics. Eight clinics (222 patients) were randomized to usual care and 8 clinics (228 patients) to intervention. Intervention patients received home telemonitors that transmit BP data to a secure database. Pharmacists consult with patients by phone and adjust antihypertensive therapy based on home BP data. The intervention lasts 12 months with follow-up to 18 months to observe durability. The primary outcome is BP control at 6 and 12 months, defined as BP $\leq 140/90$ mm Hg (or $\leq 130/80$ mm Hg in patients with chronic kidney disease or diabetes). Data on demographics, medication use and adherence, and satisfaction with care were also gathered. Here we report 6-month BP outcomes. General and generalized linear mixed models are used to accommodate the cluster-randomization.

Results: Enrollees were 45% female, 83% white, and 13% black, with mean age of 61 years. Mean BP at baseline was 148/85 mm Hg in both treatment groups. Of the 403 attending the 6-month visit (197 usual care, 206 intervention), 45.2% in usual care and 71.8% in intervention achieved BP control ($p < 0.0001$). In usual care, mean systolic BP decreased by 10.3 mm Hg and diastolic decreased by 3.4 mm Hg. In intervention, mean systolic BP decreased by 21.6 mm Hg and diastolic decreased by 9.3 mm Hg. The difference in change between groups was 11.3 mm Hg systolic ($p < 0.0001$) and 5.8 mm Hg diastolic ($p = 0.003$). Self-reported satisfaction with care in the six months following baseline was higher for intervention (mean=4.6) than usual care (mean=4.4, $p < 0.01$), on a 5 point scale (1=worst care possible, 5=best care possible). Between baseline and 6 months mean number of antihypertensive drugs used per participant increased from 1.4 to 1.6 in usual care and from 1.5 to 2.3 in intervention. The difference between treatment groups in increased drug use from a particular class was largest among thiazide diuretics (4.6% increase usual care, 27.6% intervention) and ACE inhibitors (1.6% increase usual

care, 13.6% intervention). Calcium channel blocker and beta blocker use also increased more among intervention patients, while loop diuretic use decreased. Self-reported adherence to BP medications indicated better adherence for intervention (mean=0.7) than usual care (0.3, $p<0.01$) measured on the Morisky scale (0-4, lower scores indicating better adherence) during the 6 months following the baseline visit.

Conclusions: Home telemonitoring with pharmacist case management was effective at reducing BP for hypertensive patients over 6 months. This intervention may be cost-effective for managing hypertensive patients with uncontrolled BP, especially if results are sustained during the maintenance and post-intervention phases of follow-up.

Author Disclosures: **K.L. Margolis:** None. **A.R. Bergdall:** None. **S.E. Asche:** None. **J.M. Spert-Hillen:** None. **M.V. Maciosek:** None. **N.K. Schneider:** None. **T.J. Kerby:** None. **R.A. Pritchard:** None. **J.L. Sekenski:** None. **P.J. O'Connor:** None.