A Pharmacist-Led, American Heart Association Heart360 Web-Enabled Home Blood Pressure Monitoring Program

Background:

- Hypertension is one of the most prevalent diseases in the United States, with less than half of patients maintaining adequate blood pressure control.
- Previous similar studies have shown positive results from implementing home monitoring blood pressure programs but have had several limitations, including complex study designs and exclusion of important patient populations.

Objective:

- The objective of the study was to evaluate the effectiveness of reaching blood pressure goal in patients with uncontrolled hypertension by a pharmacist-led, American Heart Association Heart360 web-enabled home blood pressure monitoring program compared to usual care.

Methods:

- **Design:** randomized, controlled, open-label, parallel group study; **Duration:** 6 months
- **Inclusion criteria:** ages 18-79; diagnosis of hypertension with 2 most recent clinic blood pressure readings above goal (systolic $\geq$140 mmHg or diastolic $\geq$ 90 mmHg), or for those with diabetes or chronic kidney disease (systolic $\geq$ 130 mmHg or diastolic $\geq$ 80 mmHg); $\leq$ 3 antihypertensive medications; primary care provider at 1 of the 10 participating clinics; registered on KPCO My Chart Website.
- **Exclusion criteria:** limited life expectancy; age 80 or older; recent myocardial infarction, stroke, percutaneous coronary intervention, or coronary artery bypass graft surgery; end stage renal disease; did not speak English; no access to Internet (including computer with USB port and Internet Explorer 6.0 or higher); blood pressure at baseline was already at goal; or home blood pressure cuff could not be validated
- **Patients enrolled:** 348: 173 usual care group, 175 home blood pressure monitoring group
- **Drug regimens/dosages used:** usual care group or home blood pressure monitoring group (included additional counseling by clinical pharmacists, reminder calls and e-mails)
- **Primary Outcome Measure:** Proportion of patients achieving goal blood pressure at 6 months.
- **Secondary Outcome Measures:** The change in systolic and diastolic blood pressure between baseline and the 6 month clinic visit, the change in antihypertensive medication intensity, and antihypertensive medication adherence.
- **Power:** 80% to detect a 14% difference in blood pressure control
- **Data handling method:** intent to treat

Results:

- **Total patients completed:** 326: 164 usual care, 162 home monitored blood pressure
- **Primary Outcome Measure:** proportion of patients achieving blood pressure goal was higher in the home blood pressure monitoring group (51.7% vs. 21.9%; adjusted risk ratio 2.5; 95% CI 1.6-3.8)
- **Secondary Outcome Measures:** The home blood pressure monitoring group experienced 12.4 mmHg larger drop in SBP than the usual care group (95% CI, 21.0 to 9.8) and a 7.3 mmHg larger drop in DBP (95% CI, 10.4 to 4.1). More patients in the home monitored group had an antihypertensive medication added to their regimen (70% vs. 25%, $p<0.001$), and had the dose increased for an existing antihypertensive medication (43% vs. 12%, $p<0.001$). Of the patients purchasing medications at KPCO pharmacies there was no difference in the mean medication possession ratio adherence score.

- **Author's conclusion:** Home blood pressure monitoring protocol led to better control of blood pressure and the majority of patients in the home monitoring group were satisfied with the hypertensive care they received.

Strengths:
- Patients with diabetes and chronic kidney disease co-morbidities were included
- The Heart360 is a free website available to the public
- Relatively simple study protocol

Limitations:
- Duration of study is inadequate to determine long term effects
- Small proportion of patients actually studied based on the size of the healthcare system
- No data were reported on patients' diet and exercise habits
- Standard deviation was not reported for continuous data
- Patients must have access to the Internet
- Patients enrolled may be more willing to play an active role in their health care than general public.

Conclusion:
- Home blood pressure monitoring with the use of the Heart360 website led to better control of blood pressure. The use of pharmacists in collaborative practice agreements allowed adjustments in therapy to occur in a timely manner. This study has great clinical significance, with the potential to change the standard of care for hypertension.
- Further study is needed in a wider variety of healthcare systems. Also, a prolonged study duration will determine the long term benefits of a home monitoring blood pressure program.

Reference:
Magid DJ, Olson KL, Billups SJ, Wagner NM, Lyons EE, Kroner BA. A Pharmacist-Led, American Heart Association Heart360 Web-Enabled Home Blood Pressure Monitoring Program. Circ Cardiovasc Qual Outcomes. 2013; 6(2): 157-63.

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