

# Home monitoring service was more effective than usual care in patients with essential hypertension

Rogers MA, Small D, Buchan DA, et al. Home monitoring service improves mean arterial pressure in patients with essential hypertension. A randomized, controlled trial. *Ann Intern Med.* 2001 Jun 5;134:1024-32.

## QUESTION

In patients with essential hypertension, does a home monitoring service (HMS) improve mean arterial pressure more than does usual care?

## DESIGN

Randomized (allocation concealed\*), unblinded,\* controlled trial with median 11-week follow-up.

## SETTING

University-affiliated primary care outpatient clinics in New York, USA.

## PATIENTS

121 patients (mean age 62 y, 50% women) with essential hypertension who needed to change their antihypertensive therapy because of elevated blood pressure (BP) despite current use of antihypertensive medication, with undesirable side effects from the current antihypertensive drug, or with an office systolic BP  $\geq 180$  mm Hg or a diastolic BP  $\geq 110$  mm Hg with no current use of medication. In patients with diabetes mellitus, heart disease, stroke, nephropathy, peripheral arterial disease, or hypertensive retinopathy, an office systolic BP  $\geq 130$  mm Hg or an office dia-

stolic BP  $\geq 85$  mm Hg was needed to be eligible. Exclusion criteria included age  $< 18$  years, pregnancy, secondary hypertension, and lack of mental or physical capability to monitor BP at home. 92% completed the trial.

## INTERVENTION

60 patients were allocated to HMS, during which automatic BP measurements were transmitted by phone to a central site. BP readings were recorded in a computerized report and then forwarded to patients and their physicians once a week. Physicians altered the dose or type of antihypertensive medication as needed by telephone or office visit. 61 patients were allocated to usual care.

## MAIN OUTCOME MEASURES

Mean arterial, systolic, and diastolic BP as measured by 24-hour ambulatory BP monitoring.

## MAIN RESULTS

Analysis was by intention to treat. Difference in mean change in arterial, systolic, and diastolic BPs between the treatment and control groups was statistically significant (Table).

## CONCLUSION

In patients with essential hypertension, a home monitoring service improved mean arterial, systolic, and diastolic blood pressures better than did usual care.

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\*See Glossary.

## Home monitoring service (HMS) vs usual care for essential hypertension

Outcomes	HMS	Usual care	Mean difference (95% CI)
Arterial pressure (mm Hg)	-2.8	1.3	4.1 (0.91 to 7.38)
Systolic pressure (mm Hg)	-4.9	-0.1	4.8 (0.10 to 9.37)
Diastolic pressure (mm Hg)	-2.0	2.1	4.1 (0.93 to 7.13)

## COMMENTARY

Three fourths of patients with hypertension do not meet the definition of "controlled" (1). The study by Rogers and colleagues assesses the effect of home BP recording with an automated device combined with automated transmission of data by telephone to provide weekly reports for physicians and patients. Although the results are interesting and the conclusions reached are important, we must consider whether the process as described in the abstract was responsible for the results. Patients who were monitored at home had lower BP regardless of whether they had a change in medication. This finding raises the strong possibility that the BP effects seen were secondary to the attention to BP provided by intensive involvement in the protocol (checking BP 6 times/d, 3 d/wk) or perhaps because of increased physician involvement or lifestyle changes. It is also reasonable to assume that the level of adherence to medications would be higher in this group of patients, and unfortunately medication compliance was not measured to resolve this issue. A more appropriate control group would have removed this source of bias by having participants in the study use the cuffs but send data only to the intervention group's physicians.

Determining the value of this service is important because at a cost of US \$25 per month many patients with hypertension will probably not be able to afford it. A consensus conference suggested that home BP monitoring might be better for long-term management than

(periodic) ambulatory BP monitoring (2) and the cost would be less. Before this intervention is instituted, additional studies should be done that address the mechanism for BP improvement as well as the cost-effectiveness of this approach.

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## References

1. Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure. Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure; 1997; NIH publication no. 98-4080: 3-6.
2. Herpin D, Pickering T, Stergiou G, de Leeuw P, Germano G. Consensus conference on self-blood pressure measurement. Clinical applications and diagnosis. *Blood Press Monit.* 2000;5:131-5.

## Author's response

The monitoring service was designed to influence the behavior of both physicians and patients. It was meant to provoke lifestyle changes. This was not bias but part of the intervention. Although separating the effects of physician and patient behaviors may be of academic interest, both ultimately affect blood pressure in everyday life.