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INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

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## **Guideline Impact Study Summary: Treatment of Hypertension**

ICSI commissioned the Group Health Foundation to evaluate the impact of the hypertension treatment health care guideline on the quality of care at two ICSI-affiliated medical groups. The purpose of the study was to assess how well the guideline met its two major goals of improving blood pressure control in patients with identified hypertension and encouraging the use of thiazide diuretics and beta-blockers, which are the only agents proven to reduce mortality, and are also inexpensive. The study was led by Patrick J. O'Connor, MD, MPH, with the assistance of Elaine S. Quiter, RD, MS, William A. Rush, PhD, and Seongryeol Ryu, PhD.

This summary includes the key features, findings and caveats described in the study.

### **Methods**

The study was conducted in two ICSI-affiliated primary care group practices: Northfield Clinic, now part of HealthSystem Minnesota, and MinnHealth, now part of Family Health Services Minnesota. Using a quasi-experimental before and after design, the study assessed changes in the care provided to patients with identified hypertension at two periods of time—one 12-month period before the guideline was released (calendar year 1993), and a second 12-month period after the guideline was implemented (Northfield: June, 1995–May, 1996; MinnHealth: September, 1995–August, 1996).

To be included in the study, a patient must have been:

- at least 18 years of age
- identified as having hypertension within the defined 12-month period under study
- a patient for at least one clinic visit for hypertension in the defined 12-month period under study.

The pre-guideline study group included 685 patients, while the post-guideline group included 928 patients. In all, 1,613 patients were included in the study.

### **Guideline Implementation Strategies**

The two medical groups studied independently arrived at similar guideline implementation strategies. Key elements included educating physicians and staff about hypertension treatment, standardizing blood pressure measurement, improving documentation of medications, identifying hypertensive patients who were not receiving regular care, and reaching out to such patients by either telephone or mailed reminders.

## Results

Taken in aggregate, control of blood pressure improved in the two medical groups, as shown in Table 1.

**TABLE 1**  
PROPORTION OF HYPERTENSIVE PATIENTS MEETING TARGET BLOOD PRESSURE LEVELS  
PRE- AND POST-GUIDELINE IMPLEMENTATION

<i>Target blood pressure level</i>	<i>Pre<sup>1</sup></i>	<i>Post</i>	<i>Significant</i>
DBP <sup>2</sup> <90 and SBP <sup>3</sup> <140 (for age <65) or <160 (for age ≥65)	48.6%	60.3%	yes (p<.001)

Although the sample sizes were not chosen to be large enough to detect changes in the two medical groups considered individually, Table 2 shows that the improvement at Northfield was statistically significant and at MinnHealth nearly so.

**TABLE 2**  
PROPORTION OF HYPERTENSIVE PATIENTS MEETING TARGET BLOOD PRESSURE LEVELS  
PRE- AND POST-GUIDELINE IMPLEMENTATION, BY MEDICAL GROUP

### Northfield Clinic

<i>Target blood pressure level</i>	<i>Pre<sup>1</sup></i>	<i>Post</i>	<i>Significant</i>
DBP <sup>2</sup> <90 and SBP <sup>3</sup> <140 (for age <65) or <160 (for age ≥65)	43.4%	61.2%	yes (p<.0001)

### Minn Health

<i>Target blood pressure level</i>	<i>Pre<sup>1</sup></i>	<i>Post</i>	<i>Significant</i>
DBP <sup>2</sup> <90 and SBP <sup>3</sup> <140 (for age <65) or <160 (for age ≥65)	53.8%	59.7%	no (p<.10)

<sup>1</sup> For comparison, national statistics show that about 30% of adults with identified hypertension have their blood pressure adequately controlled.

<sup>2</sup> DBP=diastolic blood pressure

<sup>3</sup> SBP=systolic blood pressure

There was not a statistically significant change in the proportion of hypertensive patients for whom guideline-recommended medications were prescribed. Thiazide diuretics and beta blockers were prescribed for 35.9% of all patients pre-guideline implementation, while 36.2% received them post-guideline.

## Discussion

The ICSI hypertension treatment guideline appeared to be related to improved blood pressure control, which would be expected to reduce subsequent coronary artery disease, congestive heart failure, renal disease, and other complications of uncontrolled hypertension. On the other hand, the guideline did not appear to result in any increase in the use of recommended blood pressure medications, which are less expensive than most alternative blood pressure medications. It seems unlikely that the implementation of the guideline would result in short-term reductions in costs of medical care.

The proportion of hypertensive patients with controlled blood pressure rose from 48.6% to 60.3% after guideline implementation. This degree of improvement is impressive from both the clinical and statistical perspective.

It is not certain that these improvements in clinical outcomes were causally related to implementation of the ICSI guideline. It is possible that a broad secular trend towards better blood pressure control could have accounted for such an improvement without the guideline. However, the pace of improvement in blood pressure control during the past 20 years has been slow, and the study clinics showed a dramatic improvement in blood pressure control in a short period of time.

Interviews showed that the two medical groups studied used the ICSI guideline enthusiastically and systematically starting in 1995. Both groups independently arrived at similar guideline implementation strategies that appeared to be effective. It seems very likely that their implementation efforts and desire to improve care of hypertension accounted for the improved outcomes. Perhaps because of the "team" care model, special emphasis was placed on accurate recording of current blood pressure medications. These simple "office system" strategies have been shown in other studies to improve care for other chronic diseases, and may be usefully applied at other clinical sties.

While levels of blood pressure control improved during the study period, there was no evidence that more patients were being treated with guideline-recommended drugs. Diuretics and beta blockers were recommended because only these two classes of drugs have been conclusively shown in randomized clinical trials to reduce total mortality among patients with hypertension. However, other classes of blood pressure medications have been shown to be safe and effective in controlling blood pressure. The controversy in medical literature and the physicians' desire to tailor medications to individual patients' needs may have constrained the use of guideline recommended medications.