

# Clinical guidelines and the management of hypertension: a between-practice and guideline comparison

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## SUMMARY

*It has previously been demonstrated that individual general practitioners (GPs) diagnose and treat at different levels of blood pressure and according to different risk factor profiles. This study sought to examine the variation in the achievement of control of hypertension in a sample of 20 treated hypertensive patients in 18 UK general practices. There was a marked between-practice variation in the percentage of patients with controlled hypertension. Practices appear to apply different hypertension guidelines to patients consistently, with significant correlations across practices in seven out of ten possible guideline combinations. There remains marked variation in the management of hypertension between different general practices in the UK. Factors other than recommendations in guidelines appear to be responsible for this variation.*

*Keywords: hypertension; guidelines; treatment.*

## Introduction

HYPERTENSION guidelines differ in the content and emphasis of their recommendations.<sup>1</sup> We have previously shown that estimation of control of hypertension in individuals varies with the hypertension guideline standard that is followed.<sup>2</sup> This paper seeks to establish and quantify between-practice variation in the management of hypertension. In addition we sought to examine whether between-practice variation persisted when five different hypertension guidelines were applied.

## Methods

The detailed methodology of this study is presented elsewhere.<sup>2</sup> In brief, individual patient-based morbidity data were collected from 18 Oxfordshire practices that subscribe to the VAMP (Value Added Medical Products) computer system. A systematic sample of 50 patients per practice was obtained by taking every 10th person from the practice hypertension register. For a patient to be defined as hypertensive for the purposes of this study, a diagnosis of hypertension had to be clearly marked in the patient's record in the computer database, and the patient had to be taking blood pressure lowering medication at the time of the study. Control of hypertension was judged according to the criteria in each of four national hypertension guidelines (those of New Zealand, Canada, US, and the UK), as well as those of the World Health Organization (WHO).

Results are presented as descriptive statistics (specifically, the

median and the range) of the percentage of patients in each of the 18 practices who had controlled hypertension according to each of the five hypertension guidelines. An assessment was then made of whether, relative to one another, individual general practices managed their hypertensive patients consistently according to the five hypertension guidelines. To investigate this, general practices were ranked in descending order according to the percentage of patients who were controlled according to each hypertension guideline separately. For each of the 10 possible pairs of guidelines, Spearman's rank correlation coefficients were calculated. High correlation reflects a situation where practices are ranked in the same order when two hypertension guidelines are compared.

## Results

When individuals without a blood pressure reading were excluded, 879 patients were available for analysis. The proportion of individuals judged to have controlled hypertension varied substantially between the 18 participating practices (Table 1). This between-practice variation persisted for all five hypertension guidelines. The median value (range) for the five sets of guidelines were: New Zealand 63% (32–79%), Canadian 90% (60–96%), US 20% (2–37%), UK 49% (16–69%), and WHO 29% (7–52%). There was a significant rank correlation coefficient in seven out of ten possible guideline combinations.

In addition, we explored whether the proportion of patients with controlled hypertension is explained by differences in the completeness of data recording across individual practices. We calculated the rank correlation coefficients between the (practice-based) proportions 'controlled' according to each of the five guidelines and the completeness of data recording. Completeness was represented in two ways: the proportions of sampled individuals for whom at least three, and then all four, risk factors were recorded (body mass index, cholesterol reading, smoking status, and blood pressure reading). Seven of the ten correlations did not exceed  $\pm 0.15$  (the other three were +0.46, -0.35, and -0.31, with no apparent pattern). Therefore, the observed variation in control of hypertension between practices was not related to the completeness of data recorded in each practice in this study.

## Discussion

As previously observed, this study confirms that control of hypertension differs according to the hypertension guideline standard applied.<sup>2</sup> In addition, the data presented here demonstrate large variations in the proportion of patients who had controlled hypertension across individual general practices. This between-practice variation in control was observed for each of the five hypertension guidelines.

Furthermore, as the correlations between the five guidelines indicate, practices tended to manage their patients to the same extent when compared in relative terms to the other practices in this study. Thus, practices that had a high proportion of individuals controlled according to one guideline standard tended to have a relatively high proportion when the other four guidelines were

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**Table 1.** Percentage of patients with 'controlled' hypertension according to five hypertension guidelines in 18 Oxfordshire general practices.

Practice number	Number of patients per practice	% controlled NZ	Rank NZ	% controlled UK	Rank UK	% controlled Canada	Rank Canada	% controlled WHO	Rank WHO	% controlled US	Rank US
1	50	62	10	44	13.5	88	12	32	7.5	24	7
2	50	66	6	46	11	90	7	36	4	24	7
3	44	34	17	34	15	84	14	7	18	5	15
4	45	71	3	51	7	91	5	27	12	11	13
5	50	60	11.5	54	6	94	3	32	7.5	24	7
6	50	64	8	64	3	96	1	52	1	28	3
7	50	60	11.5	50	9	90	7	24	15	16	11.5
8	50	40	16	30	16	70	17	12	16	2	18
9	50	68	4.5	68	2	94	3	28	10.5	16	11.5
10	50	32	18	16	18	60	18	8	17	4	17
11	43	79	1	60	4	88	11	33	6	30	2
12	50	56	13	44	13.5	94	3	28	10.5	18	10
13	50	50	14	26	17	80	16	26	13	10	14
14	49	49	15	45	12	90	9.5	24	14	4	16
15	47	64	9	57	5	85	13	30	9	21	9
16	49	65	7	51	8	82	15	39	3	27	4
17	50	68	4.5	48	10	90	7	34	5	26	5
18	49	78	2	69	1	90	9.5	47	2	37	1

applied. It appears that general practices are conservative or progressive in their management of hypertension irrespective of which guideline standard is applied. This suggests that there may be other factors that determine management and control of hypertension. A recent randomized controlled trial that examined the effect of interpractice audit and feedback on the diagnosis and management of hypertension revealed a similar between-practice variation in six practices in London.<sup>3</sup> The percentage of patients who had met a treatment control standard of 160/90 mmHg varied between 24% and 51%, with no overall improvement in the proportion of controlled hypertensives being reported, despite intensive audit and educational intervention.<sup>3</sup>

Individual variation in the labelling and subsequent treatment of hypertension has been demonstrated when the clinical practice of 12 individual general practitioners was compared.<sup>4</sup> No such variation has previously been demonstrated in terms of the management of hypertension at a general practice level. Caution is needed in the interpretation of this cross-sectional study, since possible unknown confounding factors may be responsible for the observed correlation between practices and their extent of control when compared with other practices. However, when considering the implementation of guidelines and dissemination of research,<sup>5,6</sup> the results of this study suggest that other factors (such as the personal characteristics of doctors, their age and experience, and their willingness to change practice) have an important bearing on the response to suggested improvements in clinical practice.<sup>7</sup> Further exploration as to the nature of these factors and their influence on patient management is needed so that effective treatment strategies in the management of hypertension can be translated into patient care.

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