

Trends in the diagnosis and management of hypertension:

repeated primary care survey in South West England

Abstract

Background

Previous surveys identified a shift to nurse-led care in hypertension in 2010. In 2011 the National Institute for Health and Care Excellence (NICE) recommended ambulatory (ABPM) or home (HBPM) blood pressure (BP) monitoring for diagnosis of hypertension.

Aim

To survey the organisation of hypertension care in 2016 to identify changes, and to assess uptake of NICE diagnostic guidelines.

Design and setting

Questionnaires were distributed to all 305 general practices in South West England.

Method

Responses were compared with previous rounds (2007 and 2010). Data from the 2015 Quality and Outcomes Framework (QOF) were used to compare responders with non-responders, and to explore associations of care organisation with QOF achievement.

Results

One-hundred-and-seventeen practices (38%) responded. Responders had larger list sizes and greater achievement of the QOF target BP $\leq 150/90$ mmHg. Healthcare assistants (HCAs) now monitor BP in 70% of practices, compared with 37% in 2010 and 19% in 2007 ($P < 0.001$). Nurse prescribers alter BP medication in 26% of practices (11% in 2010, none in 2007; $P < 0.001$). Of the practices, 89% have access to ABPM, but only 71% report confidence in interpreting results. Also, 87% offer HBPM, with 93% of these confident in interpreting results.

Conclusion

In primary care BP monitoring has devolved from GPs and nurses to HCAs. One in 10 practices are not implementing NICE guidelines on ABPM and HBPM for diagnosis of hypertension. Most practices express confidence interpreting HBPM results but less so with ABPM. The need for education and quality assurance for allied health professionals is highlighted, and for training in ABPM interpretation for GPs.

Keywords

blood pressure determination; hypertension; inter-arm difference; primary care.

INTRODUCTION

Hypertension affects 30% of adults in England and is mostly managed in primary care.^{1,2} Risk of cardiovascular events rises with baseline blood pressure,³ and treatment of high blood pressure is cost-saving in comparison with no treatment.⁴ Therefore blood pressure control remains a key indicator of the Quality and Outcomes Framework (QOF) in England.⁵

Rates of blood pressure control vary between practices.⁵ Explanations for variation include practice-level organisation of care,⁶ variable adoption of guidelines by practitioners,⁷ and 'therapeutic inertia',⁸ among others. In 2007 and 2010, general practices in Somerset and Devon, UK, were surveyed to establish their arrangements for organisation of care. A shift was found towards greater nurse involvement in practice hypertension care,⁹ a trend consistent with previous systematic review findings in support of nurse-led care in hypertension.^{10,11}

In 2011 the National Institute for Health and Care Excellence (NICE) updated guidelines for managing hypertension.¹² Based on cost-effectiveness models, they recommended adoption of ambulatory blood pressure monitoring (ABPM) for confirmation of the diagnosis of hypertension;⁴ subsequently other international guidelines have also considered the role of out-of-office blood pressure measurement.^{13–15}

This study updated and repeated the

Somerset and Devon survey to document further trends in the make-up of teams delivering hypertension care, and to establish the level of implementation of current NICE guidelines for diagnosis of hypertension, measurement, and monitoring of blood pressure in South West England. It was hypothesised that differences in aspects of practices' organisation of care are associated with between-practice variations in blood pressure prevalence and control. Therefore, any relationships between organisation of care and outcomes were explored, using published QOF outcome data in a secondary analysis of the questionnaire data.

METHOD

Questionnaire design

The questionnaire was based on previous iterations, retaining questions about practice organisation to permit analysis of trends. It was updated to include questions about access to, and interpretation of, ABPM and home blood pressure measurements (HBPM). A question was added, related to a wider research programme, to explore current practice in the assessment of postural hypotension. The revised questionnaire was piloted by local GPs to inform the final online and paper versions.

Distribution

The questionnaire was distributed to all practices in Cornwall, Devon, and Somerset,

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How this fits in

Previous surveys have suggested a shift from GP to nurse-led care in hypertension. This study found that blood pressure monitoring in primary care has devolved to healthcare assistants (HCAs) in South West England. Involvement of nurse practitioners and/or prescribers was not associated with greater achievement of Quality and Outcomes Framework (QOF) targets. One in 10 practices are not implementing National Institute for Health and Care Excellence (NICE) guidelines on ambulatory (ABPM) or home (HBPM) blood pressure for hypertension diagnosis.

UK, from 18 January 2016 as an online (SurveyMonkey®) questionnaire. Invitations to participate were first sent in an e-mail with a link to the survey to all practices registered with the Clinical Research Network. Similar invitations were then included in the electronic newsletters of Cornwall, Devon, and Somerset local medical committees to all practices across the three counties; reminders were sent in the newsletters 2 months later. The paper version of the questionnaire was distributed to delegates attending a clinical research network meeting in early 2016, and in June the paper questionnaire was posted with a reply paid envelope to the managers of all

non-responding practices, with a request to pass to the practice hypertension lead. Data collection was completed at the end of July 2016.

Sample size

This was a follow-up survey so no formal sample size calculation was performed.

Analysis

Data from replies were collated on an Excel spreadsheet with the published data from the QOF year ending March 2015. QOF provides individual practice-level data on list size, numbers with hypertension (the hypertension register), and practice prevalence for hypertension. The QOF contract sets a blood pressure target of $\leq 150/90$ mmHg to be achieved for 80% or more patients on the register; individuals can be excepted from this target where it is deemed clinically inappropriate or they do not attend for care. Consequently, the QOF data include both an unadjusted target achievement rate using the denominator of all patients on the hypertension register (the raw achievement), and an adjusted achievement rate where excepted patients are omitted from the calculation (the net achievement). Numbers and rates for exception reporting are also provided for all practices.¹⁶

Where duplicate responses were received from a practice, the most complete version was entered, or, if both were complete, the first reply received. Anonymous responses were included in the reported survey findings but not in analyses by location or outcome QOF data.

Variations in QOF data were explored with Pearson's correlation coefficients, and characteristics of responding and non-responding practices were compared using *t*-tests or χ^2 tests as appropriate to the data. Trends in proportions across the three surveys were tested with the extended Mantel-Haenszel χ^2 for linear trend, and comparisons of QOF outcome data with organisational factors were made using *t*-tests.

RESULTS

Responses

The questionnaire was distributed to all 305 practices in Cornwall, Devon, and Somerset, and 117 individual practice responses were received (38% response rate). Response rates in 2007 and 2010 were 31% and 34%, respectively ($P=0.24$ for trend).⁹ Sixteen replies were anonymous so could not be linked to QOF outcome data, but were included in the survey findings.

Table 1. Characteristics of responding and non-responding practices^a

Characteristic	Responders (<i>n</i> = 101 practices)	Non-responders (<i>n</i> = 204 practices)	<i>P</i> -value
List size, mean (SD)	8446 (5127)	7212 (4212)	0.038
Hypertension prevalence, % (SD)	16.3 (3.1)	15.8 (3.3)	0.170
Exception rate, % (SD)	4.4 (2.9)	4.3 (4.0)	0.770
Last BP $\leq 150/90$, % (SD)	80.7 (5.8)	78.9 (7.0)	0.017
Last BP $\leq 150/90$ net of exceptions, % (SD)	84.5 (5.6)	82.5 (7.1)	0.010
Staff			
FTE doctors, mean (SD)	4.8 (3.3)		
FTE practice nurses, mean (SD)	2.6 (1.7)		
FTE nurse practitioners, mean (SD)	0.8 (1.4)		
FTE nurse prescribers, mean (SD)	0.8 (1.1)		
FTE pharmacists, mean (SD)	0.2 (0.4)		
FTE healthcare assistants, mean (SD)	1.9 (1.7)		
Practice classification			
Urban, <i>n</i> (%)	18 (15.4)		
Mixed, <i>n</i> (%)	43 (36.8)		
Rural, <i>n</i> (%)	34 (29.1)		
Not stated, <i>n</i> (%)	22 (18.8)		
Dispensing rights, <i>n</i> (%)	34 (29.1)		

^aData presented as mean number, or mean percentage, and SD as appropriate. BP = blood pressure. FTE = full-time equivalent. SD = standard deviation.

Table 2. Current arrangements for hypertension care in practices

Staff role	2007	2010	2016	P-value
A. Who undertakes routine checking of BP?				
GP only	1	2	3	0.810
Nurse (practice/prescriber/practitioner) only	8	8	22	0.360
HCA only	0	10	33	<0.001
Pharmacist only	0	0	2	0.310
GP/nurse team	53	30	19	<0.001
GP/HCA/nurse team	15	21	49	0.062
GP/pharmacist team	0	0	0	
B. For elevated BP, who decides to change medication?				
GP only	64	60	96	0.084
Practice nurse only	6	1	4	0.040
Pharmacist only	0	0	3	0.220
Nurse prescriber or practitioner only	0	0	30	<0.001
GP/nurse team	0	17	14	0.014
GP/pharmacist team	0	0	3	0.480
C. If change is decided, who issues the prescription?				
GP only	65	66	105	0.140
Practice nurse only	3	3	3	0.590
Pharmacist only	0	0	4	0.140
Nurse prescriber or practitioner only	0	5	33	<0.001
GP/nurse team	0	6	11	0.061
GP/pharmacist team	0	1	0	0.260
D. For a newly diagnosed hypertensive patient, who alters medication to reach target BP?				
GP only	63	61	101	0.021
Practice nurse only	6	2	3	0.050
Pharmacist only	0	0	4	0.130
Nurse prescriber or practitioner only	0	5	29	<0.001
GP/nurse team	0	10	9	0.010
GP/pharmacist team	0	1	1	0.650

BP = blood pressure. HCA = healthcare assistant.

Response rates for attributable practices across the three counties were 28% for Cornwall, 33% Somerset, and 35% Devon ($P = 0.55$).

Box 1. Definitions of staff types^a

Throughout this article, different allied health professionals are referred to using terms commonly understood in the UK NHS. These are briefly defined below:

Healthcare assistants (HCAs) work in hospital or community settings, such as GP surgeries, under the guidance of a qualified healthcare professional, usually a nurse. They work within the primary healthcare team. Sometimes staff working in HCA roles are known as nursing assistants, nursing auxiliaries, or auxiliary nurses. They do not require a nursing qualification.

Practice nurses are qualified nurses registered with the Nursing and Midwifery Council. They work in primary care as members of the primary healthcare team. In larger practices they may work within a nursing team, or in smaller practices may work alone.

Nurse practitioners are qualified registered nurses who have undergone further specialised training permitting them to perform tasks, including amending and/or delivering treatments with a degree of autonomy beyond the role of a practice nurse. They may possess a higher degree.

Nurse prescribers are qualified registered nurses who have undergone further specific training, known as non-medical prescribing, which permits them to prescribe medications from a specified list without supervision by a GP.

Pharmacists are graduates with a master's degree in pharmacy and are registered with the General Pharmaceutical Council. They work within the primary healthcare team. They are qualified to advise on and recommend changes in prescribing, and to advise and support patients in promoting safety and medication adherence.

^aThe above definitions are based on information from NHS Health Education England's websites: <https://www.hee.nhs.uk/> and <https://www.healthcareers.nhs.uk/>.

Details of responding practices are summarised in Table 1. In comparison with non-responding practices, those responding to the survey had higher list sizes and better achievement of the QOF blood pressure target $\leq 150/90$ mmHg. Only 15% of practices classified themselves as urban, and 29% were rural dispensing practices.

Current hypertension care arrangements

Current care arrangements are summarised in Table 2. Healthcare assistants (HCAs; see Box 1) are currently monitoring blood pressure, either alone or within multidisciplinary teams, in 70% of practices, compared with 37% in 2010 and 19% in 2007 ($P < 0.001$). There is a corresponding fall in GP and nurse shared monitoring from 69% to 36% and 16%, respectively ($P < 0.001$). Decisions to alter medication to control BP are now taken in 26% of practices by nurse prescribers or practitioners compared with 11% in 2010 and none in 2007 ($P < 0.001$), with a similar rise (28% now, 5% in 2010, none in 2007; $P < 0.001$) in the issuing of prescriptions by nurse prescribers. Pharmacists, alone or with GPs, are currently undertaking this role in only 5% of practices. Newly diagnosed hypertensive patients are now treated to target by nurse prescribers or practitioners alone in 25% of practices, compared with 6% in 2010 and none in 2007 ($P < 0.001$).

Changes in hypertension care arrangements

Eighty-two (73%) practices reported changes in their hypertension care arrangements during the 5-year period from 2011, compared with 36% in 2010 ($P < 0.001$); the most common changes were adoption of home monitoring (26%) and increased roles for HCAs in measuring blood pressure (19% of practices; Table 3).

Thirty-five per cent of practices reported an intention to reorganise their hypertension care in the next year. Most often stated plans in both the current and previous survey rounds were establishment of and/or increased roles for nurse-led clinics, increased use of protocols, and augmented roles for HCAs. In the latest survey there was also substantial interest in establishing pharmacist-led hypertension clinics (19 practices, compared with only one in both 2007 and 2010; $P = 0.0038$; Figure 1).

Measurement of blood pressure

In 2007 only 8% of practices reported measuring blood pressure in both arms when considering a diagnosis of hypertension. This rose to 35% in 2010 and 52% in the current survey ($P < 0.001$).

Table 3. Main types of change reported by practices since 2011

Type of change reported	N	%
More home monitoring/more home monitors available for patients	19	26.4
Increased role of HCA (for example, HCA-led clinics, reviews/check-ups by HCAs)	14	19.4
Increased role of nurses (for example, nurse-led clinics)	12	16.7
Updated protocol to fit with NICE guidelines	7	9.7
More diagnosis by ABPM	5	7.0
Increased role of pharmacist (setting up pharmacist-led clinics)	3	4.2
6-monthly check-up changed to annual check-up	2	2.8
Other ^a	10	13.9

^a 'Other' includes change in first-line drugs, increased administrative support, and adoption of lower or different targets for comorbidities, for example, diabetes. ABPM = ambulatory blood pressure monitoring. HCA = healthcare assistant. NICE = National Institute for Health and Care Excellence.

There were comparable rises in proportions checking both arms when encountering an unusual reading or reported symptoms in one arm. When asked which arm is subsequently chosen to standardise future blood pressure readings, most practices (73%) choose the higher reading arm; however, 19% would not choose an arm and 7% of practices reported basing their future care on the lower reading arm.

Nearly all practices (97%) report that sitting and standing blood pressures are checked when postural symptoms are reported; however, such checks are made routinely in only 32% of older patients and in just 4% with diabetes. On detecting postural hypotension, medication reviews are undertaken in nearly all practices (97%). Fifteen practices (13%) reported that they would also refer such patients for further assessment, and two (2%) that they would take no action.

Diagnosis of hypertension

Practices reported a range of actions on discovering a surgery blood pressure reading above 140/90 mmHg and there appear to be multiple strategies adopted within practices. One-third (33%) of respondents stated that they would take further surgery measurements, whereas most would offer some form of out-of-office assessment: 30% would offer ABPM, 44% HBPM, and 26% a choice of either.

For diagnosis of hypertension 54% of practices currently have access to ABPM in-house, 36% by referral, and 11% have no access. ABPM was available in-house for all 19 responding practices in Cornwall, 65% in Somerset, and 33% in Devon ($P < 0.001$), where a referral service was the most common mode of ABPM access (53%). Thirty per cent of practices using ABPM recorded daytime BP only, and 70% obtained a full 24-hour record. When asked about interpretation of ABPM results, only 71% of practices reported confidence in undertaking this; confidence was greatest in practices performing in-house ABPM (95%), lower in practices accessing ABPM via referral (50%), and lowest in practices without any access to ABPM (8%; $P < 0.001$).

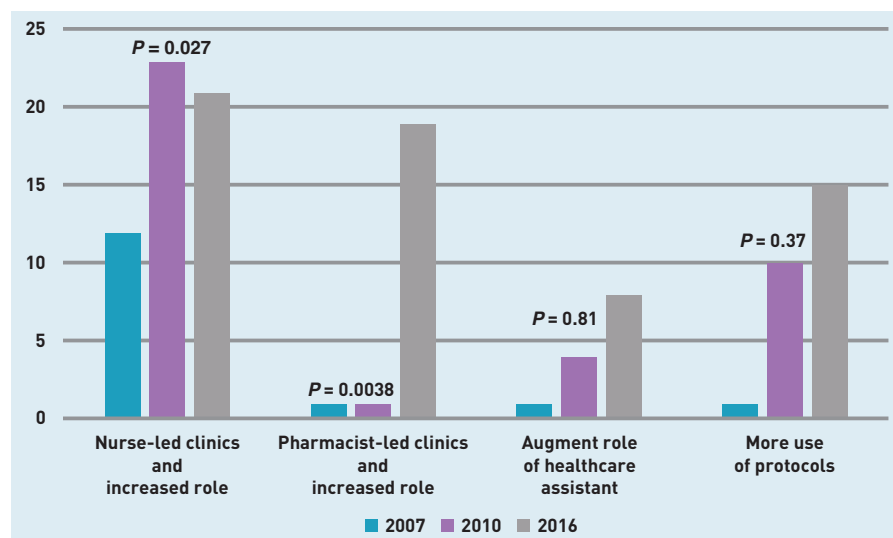
Eighty-five per cent of practices have access to in-house HBPM practice and 2% by referral; 10% reported having no access. Access varied from 71% in Cornwall to 89% in Devon and 91% in Somerset ($P = 0.12$). Most practices (77%) collect 7 consecutive days of measurements, although reported values ranged from 1 to 20 days; 93% reported confidence in interpreting HBPM data.

Quality and Outcomes Framework achievement

Raw percentage achievement of the QOF blood pressure target of $\leq 150/90$ mmHg across all practices was negatively correlated with the percentage of exception reporting by practices, and the net achievement was positively correlated (Pearson $R = -0.31$, $P < 0.001$ and $R = 0.18$, $P = 0.002$, respectively). A similar negative correlation for raw achievement and exception reporting was observed among responding practices (Pearson $R = -0.42$; $P < 0.001$; Figure 2). Therefore only practice prevalence and raw achievement rates were compared with organisational factors from the survey.

Practices with a shared-care team approach to hypertension, compared with single professional-led services, had higher recorded prevalences of hypertension (17.1% versus 15.2%, $P = 0.002$) and there

Figure 1. Practice plans for future changes in care in hypertension.



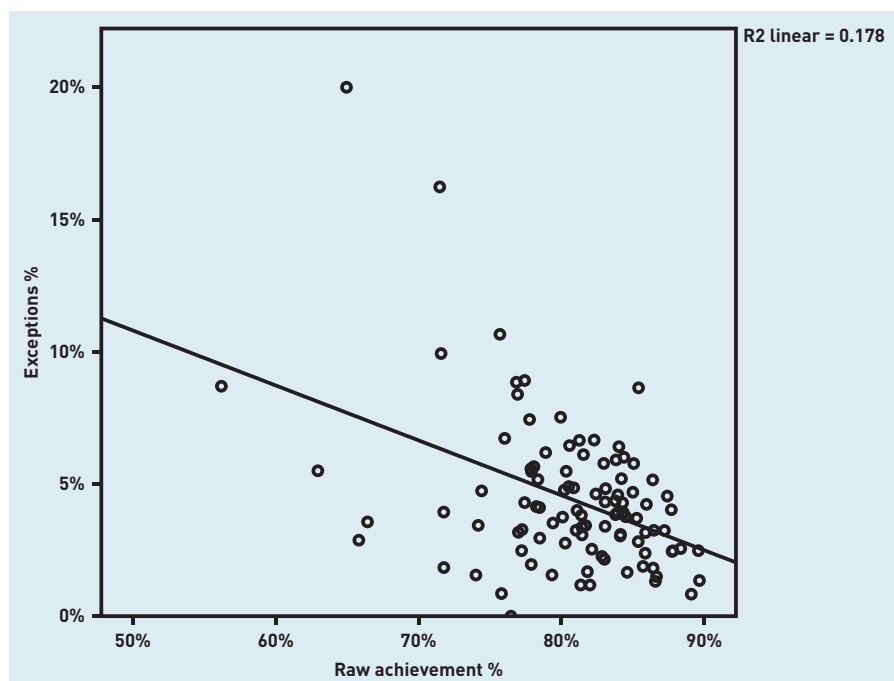


Figure 2. Exception reporting versus raw achievement of BP $\leq 150/90$ mmHg in responding practices.

was a trend towards greater attainment of the QOF blood pressure target (81.6% versus 79.5%, $P=0.068$; Table 4). Prevalence of hypertension was highest in practices without access to ABPM, lower with in-practice access, and lowest where an ABPM referral service was available (17.4%, 16.7%, and 15.3% respectively; ANOVA $P=0.039$); there was weak evidence of higher achievement of the QOF target where ABPM was available (Table 4). No differences were observed according to access to HBPM.

Thirty-four practices dispensed medications (as opposed to non-dispensing

practices, which provide prescriptions for pharmacies to fill); prevalence and achievement of target were both higher in these practices than for non-dispensing practices (prevalence 17.3% versus 15.7%; $P=0.01$ and achievement of target 82.7% versus 79.7%; $P=0.007$). Dispensing practices are predominantly rural, thus list sizes are smaller than for non-dispensing practices; however, adjustment for list size did not change the findings. Dispensing practices were, however, more likely to have access to ABPM either in-house (73.5% versus 41.0%) or by any means (97.1% versus 83.6%) when compared with non-dispensing practices ($P=0.007$).

Involvement of nurse practitioners and/or prescribers in hypertension care was not associated with greater achievement of the QOF target.

DISCUSSION

Summary

During the 9-year study period blood pressure monitoring in primary care has devolved from GPs and nurses to HCAs. This study has not demonstrated any disadvantage to hypertension care arising from the devolution of care; the findings suggest a trend towards more effective diagnosis and management. NICE guidelines on ABPM and HBPM for diagnosis of hypertension are not being implemented in around one in 10 practices. Most practices are confident in interpreting HBPM results but less so for ABPM results. Absence of access to ABPM is associated with higher practice prevalences of hypertension. Funded ABPM services, blood pressure education, and training in ABPM interpretation may

Table 4. Comparison of practice organisational factors with hypertension prevalence and blood pressure target achievement

Organisational factor	Prevalence (%)			P-value	Raw achievement of BP $\leq 150/90$ (%)			
	Absent	Present	Difference (95% CI)		Absent	Present	Difference (95% CI)	P-value
Team approach to monitoring	15.2	17.1	1.9 [0.7 to 3.1]	0.002	79.5	81.6	1.2 [−0.2 to 4.5]	0.068
Nurse practitioner or prescriber changing medication if above target	16.7	15.3	0.7 [0.02 to 2.7]	0.047	81.1	79.4	1.3 [−0.9 to 4.3]	0.20
Nurse practitioner or prescriber prescribing new medication if above target	16.7	15.4	1.4 [0.04 to 2.7]	0.043	81.2	79.7	1.5 [−1.0 to 4.0]	0.24
Nurse practitioner or prescriber altering medication until target achieved	16.4	15.9	0.7 [−0.9 to 1.9]	0.47	80.7	80.6	0.1 [−2.5 to 2.8]	0.94
Any access to ABPM	17.4	16.2	1.2 [−0.2 to 2.6]	0.078	78.3	81.0	2.7 [−0.8 to 6.3]	0.13
In-practice access to ABPM versus no access	17.4	16.7	0.7 [−1.2 to 2.5]	0.47	78.3	81.5	3.2 [−0.10 to 6.6]	0.057
Access to ABPM referral service	16.9	15.3	1.6 [0.3 to 2.9]	0.014	80.9	80.2	1.2 [−1.8 to 3.2]	0.57

ABPM = ambulatory blood pressure monitoring. BP = blood pressure.

improve the diagnosis and management of hypertension in practices.

Strengths and limitations

Despite reminders and mailshots to support the distribution of the questionnaire, the survey response rate was only 38%. This was, however, somewhat higher than previous response rates in spite of the growing pressures on primary care.¹⁷ Responding practices had larger list sizes and higher QOF target achievement than non-responders, raising the possibility that the study findings are based on activity in practices with an interest in hypertension care. Compared with the national average, the sample average list sizes were smaller and small rural and dispensing practices were over-represented.¹⁸ Consequently, a degree of caution is required in extrapolating the present findings to more urban areas.

Comparison with existing literature

In one-quarter of practices nurse practitioners or prescribers are now altering antihypertensive medication and issuing prescriptions to achieve blood pressure targets, an arrangement that was not reported at all 9 years ago. It has been found previously that greater levels of blood pressure control are achieved with nurse-led care, and ability to alter or prescribe medication appears to be an important factor in such complex interventions.^{11,19} It was expected, but not found, that there would be evidence of higher achievement of the QOF blood pressure target by practices employing nurse practitioners or prescribers in hypertension care in the present study. Previous and ongoing reviews contain international evidence to suggest such benefits from various healthcare systems;²⁰ however, the evidence base for unselected groups of hypertensive patients receiving nurse-led care in UK randomised controlled trials within primary care is limited to only three studies, including two pilot studies, with inconsistent findings.^{21–23} Therefore the absence in this survey of superior outcomes with nurse-led care is hard to interpret, because of lack of relevant supporting evidence from UK primary care. Nurses record lower blood pressure readings than doctors, which can also confound any 'true' contribution to improved outcomes.²⁴ At present, pharmacists are involved in hypertension care in only 5% of practices, but one in five practices have plans to introduce pharmacists. It has been proposed in response to the GP workload crisis that pharmacists working in primary care might also make a greater contribution

to hypertension management.^{25,26} The Clinical Pharmacists in General Practice Pilot includes a specific outcome measure of improving the proportion of people with hypertension having a blood pressure <150/90 mmHg, and reducing the proportion with uncontrolled hypertension (180/100 mmHg).²⁷ Trial evidence for improved control of blood pressure by pharmacists to date, however, is mainly derived from overseas healthcare systems in the US and Europe.¹⁹ UK evidence is restricted to three small studies of limited quality.^{28–30}

NICE hypertension guidelines recommend that checks should be made for postural hypotension in the presence of falls or symptoms, and this appears to be the case in nearly all responding practices.¹² Prevalence of postural hypotension rises with age in hypertension;^{31–33} European guidelines advise checking in older people or with patients with diabetes, both recognised risk markers.¹³ Coverage from this survey is much poorer for these groups, with only a third of practices considering older people and just 4% of patients with diabetes. Although most practices follow NICE guidance on falls to review medication on detection of postural hypotension,³⁴ a substantial number would also refer for further assessment, representing a considerable and potentially avoidable burden for secondary care.

Implications for research and practice

Most blood pressure monitoring has devolved to HCAs from practice nurses over the past 9 years. Clinic blood pressure measurements can be inaccurate if poorly carried out, and are not equivalent to controlled protocol-led measurements in research studies; however, decisions on how to manage hypertension are based on the former.³⁵ The present findings emphasise the importance of training and updates in blood pressure measurement techniques being accessible to HCAs and, increasingly, pharmacists, as well as nurses and doctors.

Hypertension guidelines recommend that blood pressure should be measured in both arms at the time of diagnosis;^{12,13} however, this has not happened in routine primary care clinical practice.^{7,36} In 2007 only 8% of practices reported checking both arms; however, over half now report that they do so, and increased patient awareness may have contributed to this rise in adoption of the guidance.³⁷ Only three-quarters of practices in which both arms are measured reported standardising subsequent readings to the higher reading arm. Use of

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Ethical approval

The study was approved by the Cornwall and Plymouth research ethics committee (08/H0203/218).

Provenance

Freely submitted; externally peer reviewed.

Competing interests

The authors have declared no competing interests.

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the lower reading arm risks underdiagnosis and undertreatment of hypertension,^{38,39} and failure to consider the associated cardiovascular risk of an inter-arm difference may prevent full consideration of personalised cardiovascular risk for individuals.^{40,41}

In 2011 NICE recommended that ABPM should be offered if a clinic blood pressure is $\geq 140/90$ mmHg to minimise overdiagnosis of hypertension because of white-coat effects.¹² Most practices appear to do this, although a third aim to confirm the need by repeating clinic measurements, and access to ABPM in this survey was associated with lower prevalences of hypertension. Although ABPM is preferred to HBPM for diagnostic accuracy, there is considerable use of home monitoring.⁴ In-surgery access to ABPM was universal among responding practices in Cornwall, compared with lower rates in both Devon and Somerset; overall the 90% access reported is consistent with the 85% reported in another large recent survey.⁴² ABPM has been implemented and funded in Cornwall through a Local Enhanced Service under the general practice contract, whereas practices in Devon or Somerset receive no financial support for implementing ABPM. Use of services outside of the practice is lower in rural dispensing practices and inversely related to proximity, which may explain the higher uptake of ABPM in those practices.⁴³ As may be expected, practice confidence in interpreting ABPM results is greatest in those practices performing

the tests in-house, although confidence was expressed for only 71% of practices overall, suggesting that educational support for GPs and nurses may be lacking. Most practices have access to HBPM but one in 10 responding practices had no access to out-of-office blood pressure measurement, suggesting that they are unable to diagnose hypertension based on NICE criteria.¹² For HBPM most practices request 7 days' worth of readings but not all patients, even in trial settings, manage to deliver these.⁴⁴ NICE guidance recommends recording two blood pressure readings twice daily, ideally in the morning and evening for at least 4 days (ideally for 7 days),¹² and studies have found that 3 or 4 consecutive days of data (two readings twice daily, discarding day 1) are as accurate as longer periods of recording when compared with ABPM as a gold standard.^{44,45}

The correlation of rising exception reporting for the hypertension target with lower raw achievement rates was unexpected. Use of exception reporting to achieve targets has been previously reported and terminal-digit bias has been associated with misclassification around blood pressure targets.^{46,47} Hypertension prevalence is greater in lower socioeconomic groups, and there are concerns that implementation of the QOF may have contributed to the inverse care law.^{2,48} Further analysis of an appropriately powered dataset is needed to fully understand the implications of this finding.

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