

**Acceptability and psychological impact of out-of-office monitoring for  
diagnosing hypertension in primary care: insights from patient survey data**

Short title: Acceptability and impact of out-of-office BP diagnostic monitoring

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## ABSTRACT

**Background** Out-of-office blood pressure (BP) is recommended for diagnosing hypertension in primary care due to its increased accuracy compared to office BP. Moreover, being diagnosed as hypertensive has previously been linked to lower well-being. There is limited evidence regarding the acceptability of out-of-office BP and its impact on well-being.

**Aim** To assess the acceptability and psychological impact coinciding with out-of-office monitoring in people with suspected hypertension.

**Design and setting** A pre- and post-evaluation of participants with elevated ( $\geq 130$  mmHg) systolic BP assessing the psychological impact of 28-days of self-monitoring followed by ambulatory BP monitoring for 24-hrs.

**Methods** Participants completed standardised psychological measures pre- and post-monitoring, and a validated acceptability scale post-monitoring. Descriptive data were compared using  $\chi^2$  tests and binary logistic regression. Pre- and post-monitoring comparisons were made using the paired t-test and Wilcoxon signed rank test.

**Results** In 93% and 85% of participants there was no impact of out-of-office BP monitoring on depression and anxiety status, respectively. Self-monitoring was more acceptable than ambulatory monitoring ( $n=183$ , median score 2.4 IQR (1.9 to 3.1) vs 3.2 (IQR 2.7 to 3.7)  $p < 0.01$ ). When asked directly, 48/183 participants (26%, 95% confidence interval (CI) 20 to 33%) reported that self-monitoring and 55/183 (30%, 95% CI 24 to 37%) reported that ambulatory monitoring made them anxious.

42    **Conclusion** Out-of-office monitoring for hypertension diagnosis does not appear to  
43    be harmful, however health professionals should be aware that in some patients it  
44    induces feelings of anxiety and self-monitoring may be preferable to ambulatory  
45    monitoring.

46

## INTRODUCTION

Out-of-office blood pressure (BP) measurement plays an increasing role in the diagnosis and management of hypertension (1, 2). Multiple measurements taken by self-or ambulatory monitoring in the patient's normal environment provide a more accurate estimate of BP, free from the white coat effect and masked hypertension (3). Out-of-office measurements are also a better predictor of long-term prognosis including cardiovascular events and mortality, compared to measurements taken in the clinician's office (4, 5). Guidelines in the UK and US recommend the use of out-of-office BP measurements are undertaken to confirm a diagnosis of hypertension (6-8).

Whilst out-of-office BP measurement may offer improved diagnostic accuracy, there is currently limited evidence regarding the acceptability to patients. A systematic review and thematic synthesis for the purposes of on-going monitoring, rather than diagnosis, found that out-of-office BP measurement empowered patients and enabled them to attribute lifestyle changes to changes in their BP (9). In a cross-sectional survey of patients with and without known hypertension, the acceptability of self-monitoring varied between ethnic groups, a finding which has implications for its implementation, accuracy estimation and impact on practice (10).

The experience of out-of-office monitoring is likely to differ in undiagnosed patients, partly due to the different motivation for self-monitoring (i.e. confirmation or disproval of their hypertensive status rather than improved BP control), as well as differences in familiarity with self-monitoring. Being labeled as hypertensive has previously been linked to lower wellbeing, including anxiety and depression (11) but little is known of whether this is linked to the process of screening or the subsequent diagnosis. The

aims of this study were therefore to explore changes in anxiety and depression status, and the acceptability of undertaking out-of-office BP monitoring by primary care patients suspected of having hypertension (12).

#### *How this fits in*

There is an increasing role of out-of-office BP monitoring to diagnose hypertension in primary care but very little is known about its acceptability and psychological impact in people with suspected hypertension. In this study, out-of-office BP monitoring had no impact on overall anxiety or depression status using validated scores but some individuals reported self-monitoring (26%) and ambulatory monitoring (30%) made them anxious. Self-monitoring was more acceptable than ambulatory monitoring. Out-of-office monitoring for hypertension diagnosis does not appear to be harmful, however in some patients it induces feelings of anxiety and this should be carefully monitored by health professionals.

## **METHODS**

### **Study design and participants**

General practitioners (GPs) from four surgeries identified consecutive patients aged between 40 and 85 years presenting with a single office systolic BP between 130 and 179 mmHg. Those diagnosed with and/or treated for hypertension, atrial fibrillation, autonomic failure or dementia, or unwilling to monitor their own BP were excluded.

### **Test procedures**

Identified patients were invited to a baseline assessment conducted by trained clinic staff to confirm their eligibility, obtain informed consent, and collect baseline data including a questionnaire (12). Following brief training, participants were asked to monitor their BP at home for 28-days (twice in the morning, twice in the evening) using an automated, Bluetooth enabled BP monitor. After 28-days of self-monitoring, participants returned to the clinic where they were fitted with an ambulatory BP monitor (ABPM) for 24-hours and asked to complete a follow-up questionnaire on its removal.

The psychosocial measures collected via the baseline and follow-up questionnaires were: the Hospital Anxiety and Depression Score (HADS), a 14 item scale with half of the items relating to either anxiety or depression (13), the National Institute of Health and Care Excellence (NICE) Depression Screening Tool, comprising of two questions (14); and the EQ-5D which is made up of two components – 1) describing one's health state via scoring five dimensions including anxiety/depression and 2) a self-rated overall health status reported using the visual analogue scale.(15). These generic instruments were chosen – rather than those specifically designed for hypertensive patients – as our cohort contained both normotensive and hypertensive participants. The follow-up questionnaire also contained a validated scale rating the acceptability of aspects of the experience of self- and ambulatory monitoring (16). The questionnaires included space for study participants to write free text comments.

## **Data cleaning**

We included participants who returned both questionnaires in the pre- and post-monitoring comparison of standardised psychological measures. Those who completed the first questionnaire over 7-days after their baseline assessment were

excluded. For the investigation into acceptability, all participants who returned their follow-up questionnaire and completed all items of the score were eligible.

## Analysis

Statistical analyses of the questionnaire data were performed in SPSS (version 24). Comparisons of descriptive data were conducted using  $\chi^2$  tests for categorical variables and binary logistic regression for continuous variables. Pre- and post-monitoring comparisons were made using the paired t-test and the related samples Wilcoxon signed rank test.

Responses to the HADS items were scored 0 to 3. A total score of >7 for each subscale was used to define the presence of depression or anxiety (13) whilst a positive answer to either of the NICE Screening Tool questions indicated the presence of depression (14). For EQ-5D, positive responses – “*some problems*” and “*severe problems*” – were combined into “*any problems*” and compared to “*no problems*” (17).

We compared our acceptability findings to those from previous studies that had used the validated scale (10, 16, 18). Based on prior studies, the acceptability score was calculated as the average of all 13 individual items with scoring reversed for the three positively worded items (item 11 “*It was worth the trouble to get accurate readings*”, item 12 “*I felt in control*” and item 13 “*A good way to save doctor/ nurse time*”). We used mean scores to enable comparison to the previously published data.

We analysed free text questionnaire answers using a pre-specified framework based on the domains of the validated acceptability scale in order to contextualise the quantitative data.

## RESULTS

### Pre-post BP monitoring comparison

From the total cohort of 247 patients, 140 participants completed both the baseline questionnaire within 7-days of their baseline assessment and the follow-up questionnaire (figure 1). Participants' mean age was 57.7 years (standard deviation (SD) 9.8), and 77 (55.0%) were female (table 1). Older and female participants were more likely to be eligible for inclusion in this analysis (difference in percentage of women +12.9%,  $p = 0.04$ ; difference in mean age +3.3 years,  $p = 0.01$ ). There was no significant difference in hypertension status, based on diagnosis via ambulatory BP, between the included and excluded participants (52.7% vs 55.5%,  $p = 0.69$ ).

### *Change in depression and anxiety status*

Female participants were significantly more likely than men to be classified by HADS as depressed or anxious at baseline or follow-up (table 2). These findings were replicated across the NICE depression screening tool and the anxiety or depression dimension of EQ-5D (see Supplementary tables 1, 2 and 3).

The HADS depression and anxiety status of most of the 135 participants with data did not change during the study (tables 3a and 3b). The status of 9 (6.7%, 95% CI 3.3 to 11.8%) participants classified as depressed at baseline improved and were not depressed at follow-up. Fifteen participants (11.1%, 95% CI 5.7 to 15.7%) were recorded as anxious at baseline and not anxious at follow-up based on HADS. Conversely, 1 person (0.7%, 95% CI 0.1 to 3.4%) changed category in the opposite

direction to become depressed at follow-up whilst 5 people (3.6%, 95% CI 0.7 to 7.1%) were categorised as not anxious at baseline and as anxious at follow-up.

Due to the small sample, it was difficult to assess the characteristics of those whose status improved (24 individuals in total). In terms of the depression sub-scale, 6 out of 9 (66.7%, 95% CI 34.8% to 89.6%) were female and 7 out of 9 (77.8%, 95% CI 45.6 to 95.1%) were subsequently found not to be hypertensive. For anxiety, 9 out of 15 (60.0%, 95% CI 35.3% to 81.2%) were female and 8 out of 15 (53.3%, 95% CI 31.9% to 79.7%) were subsequently found not to be hypertensive.

On average, there was no change in the paired HADS depression sub-scale score (n = 135, median 0.0, IQR 0.0 to 2.0) and a slight improvement in the anxiety sub-scale score (n = 135, median 1.0, IQR 1.0 to 4.0) during the period of out-of-office monitoring.

#### *Change in EQ-5D*

The median score of the self-rated global health status measured using the visual analogue scale of the EQ-5D was 80 out of 100 (IQR 75 to 90) at baseline improving to 85 (IQR 75 to 92) at follow-up (p = 0.05. Wilcoxon rank test), less than the proposed minimal clinically important difference of 10 points (19). There was no significant change in the number of participants reporting problems in mobility, usual activities and pain dimensions of EQ-5D at follow-up (see Supplementary table 4).

### **Acceptability of self- versus ambulatory-monitoring**

#### *Participant characteristics*

183 out of the 229 participants that received the follow-up questionnaire (79.9%) provided complete acceptability data (figure 1). The mean age of these participants was 56.4 years (SD 9.7) and 90 (49.2%) were female (table 1). There were no significant differences between these participants and those who failed to provide acceptability data (table 1).

### *Quantitative results*

Overall, self-monitoring was rated as more acceptable than ambulatory monitoring (table 3). Cohort members reported that ambulatory monitoring was associated with greater disturbance to home life, sleep, and work, and was more uncomfortable compared to self-monitoring.

For both measurement techniques, on average the cohort disagreed with the statement “it made me anxious” (median score 2.0, IQR 1.0-5.0 for both measurement modalities). However, 48 patients (26.2%, 95% CI 19.7 to 32.8%) and 55 (30.1%, 95% CI 23.5 to 36.6%) agreed with the statement to some extent for self- and ambulatory monitoring respectively (i.e. scored 5 or higher). Women were more likely to agree that ambulatory monitoring was anxiety-inducing than men (37.8% vs 22.6%,  $p = 0.03$ ). A similar pattern was observed for self-monitoring but was not statistically significant (31.1% vs 21.5%,  $p = 0.14$ ).

In the other dimensions of acceptability investigated, there were no statistically significant differences between the scores of men and women for self-monitoring. However, women were more likely to score ambulatory monitoring as making them feel self-conscious (median score 4.5, IQR 2.0 to 6.0 vs median score 2.0, IQR 2.0 to

5.0 for men,  $p < 0.01$ ) and less likely to describe themselves as feeling in control (median score 5.0, IQR 3.0 to 6.0 vs 5.0, IQR 4.0 to 6.0 for men,  $p = 0.05$ ). Overall, female participants rated ambulatory monitoring as slightly less acceptable than male participants (median score 3.3 IQR 2.7 to 3.9) vs 3.0 IQR (2.69 to 3.6),  $p = 0.09$ ).

When classified by their HADS status at follow-up, anxious cohort members rated both monitoring modalities as less acceptable than their non-anxious counterparts (self-monitoring: median score IQR 2.9, 2.2 to 3.4 vs median score 2.3, IQR 1.8 to 2.8 respectively,  $p < 0.01$ ; ambulatory monitoring median score 3.3, IQR 2.9 to 4.2 vs median score 3.1, IQR 2.6 to 3.7,  $p = 0.01$ ). A similar pattern was observed amongst depressed and non-depressed cohort members, although the difference was not statistically significant (see Supplementary table 5).

Table 4 compares our acceptability findings to those from previously published studies. In each cohort, the mean score was lower (i.e. more acceptable) for self-monitored BP than ambulatory BP.

### *Qualitative results*

Table 5 illustrates patients' experiences of the acceptability of out-of-office BP monitoring. Participants did not provide any free text comments for three of the categories/questions, namely how self-monitoring made them feel self-conscious, any difficulties they had remembering to self-monitor or the benefits on clinician time.

## **DISCUSSION**

### **Summary of results**

We sought to ascertain the impact of out-of-office monitoring on anxiety and depression status in patients with suspected hypertension and found both of these remained unaltered for most participants when assessed using standardised, generic measures.

When asked directly about out-of-office monitoring, a quarter of participants reported that self-monitoring, and almost a third reported that ambulatory monitoring, made them feel anxious. On average, self-monitoring was rated as more acceptable than ambulatory monitoring. Women found ambulatory monitoring less acceptable than men.

### **Strengths and Limitations**

To the best of our knowledge, this is the first study to investigate the acceptability and psychological impact of out-of-office BP monitoring for diagnostic purposes using validated measures in a clinically relevant primary care population.

Our study is not without limitations: Baseline psychological measures were collected after the participants had been identified as being potentially hypertensive and their GP had suggested participating in the study. This may have elevated baseline anxiety and depression scores, and explain the subsequent fall observed at follow-up. Furthermore, there was no control arm of patients with a raised office BP reading who

254 did not undergo out-of-office-monitoring. Therefore, we cannot rule out the effect of  
255 regression to the mean.

256  
257 Perhaps the biggest limitation is that participants underwent home monitoring followed  
258 by the 24-hour ABPM which may have biased their recollections and acceptability  
259 scoring. Our study collected the patient self-monitored BP readings via a blue-tooth  
260 connection between the BP monitor and a mobile phone. This additional layer of  
261 technology - particularly in rural areas with limited mobile telephone network coverage  
262 – may have altered the acceptability of self-monitoring, most likely in a negative  
263 direction.

264  
265 Our cohort was predominately white (12). The Blood Pressure in different Ethnic  
266 Groups (BPEth) study found that the cross-sectional acceptability of BP monitoring  
267 varied between ethnic groups with patients from minority ethnic groups rating office,  
268 ambulatory and self-monitoring less favourably than white British participants (10).  
269 Therefore, our results may be of limited generalisability to patients from ethnic minority  
270 groups.

## 271 272 **Comparison with existing literature**

273 In our sample, female participants were more likely to be classified as depressed or  
274 anxious across the various measures used, reflecting general population data (20, 21)

275  
276 Like our study, the TASMINH2 trial found that quality of life increased following a  
277 period of self-monitoring (and self-titration) by hypertensive patients, although the

278 difference was not statistically significant (22). The trialists also found that anxiety  
279 scores did not differ over time or between arms.

280  
281 Our finding that self-monitoring is, on the whole, more acceptable than ambulatory  
282 monitoring when diagnosing hypertension replicates results previously obtained in  
283 secondary care settings. A Scottish study found that 81% of patients preferred self-  
284 monitoring over ambulatory monitoring to confirm or exclude hypertension (23).  
285 Reasons given by patients were the ability to instantly see their results, being more in  
286 control, less embarrassed in public and no interference with sleep. Those that  
287 preferred ambulatory monitoring liked that it was over in one day. In a cohort of  
288 untreated patients of a Greek hypertension outpatient clinic, self-monitoring was more  
289 acceptable and preferable to ambulatory monitoring, although both modalities were  
290 generally felt to be acceptable, accurate and convenient (24).

291  
292 The out-of-office BP acceptability scale has been used in three other published  
293 studies: It was validated by Little *et al* in a sample of 200 UK primary care patients  
294 recently diagnosed or with poorly controlled hypertension (16). Lindroos *et al* used it  
295 in Finland on 223 participants of a population-based health survey, 27% of whom were  
296 receiving antihypertensives (18) whilst Wood and colleagues studied 770 people with  
297 or without diagnosed hypertension to explore ethnic differences in acceptability (10).

298  
299 The oldest study (16) had the lowest acceptability scores for both ambulatory and self-  
300 monitoring perhaps due to larger, bulkier monitors. Our study, unlike the other cohorts,  
301 did not include patients already diagnosed with hypertension and, due to its diagnostic  
302 primary aim, patients were required to self-monitor for 28 days. This is longer than the

other studies (Lindroos & Wood 7 days, Little duration not reported), and longer than current guideline recommendations (8). This increased measurement burden may have reduced the acceptability of self-monitoring and may account for the smaller difference observed between the mean scores of the modalities in our study. Conversely monitoring for an extended period may have enabled participants to develop a routine, normalising this behaviour and reducing anxiety when attempting to measure their BP, as suggested in the free text comments.

The NICE hypertension guidelines (8) recommend self-monitoring for the diagnosis of hypertension if a patient is unable to tolerate ambulatory blood pressure monitoring. Our results suggest that women find the latter less tolerable and more anxiety-inducing, and therefore could be directed towards self-monitoring during diagnosis by their healthcare professional.

### **Implications for research**

With approximately a quarter of participants reporting that self-monitoring made them anxious, further research is needed into how to identify and understand how best to support these patients undergoing out-of-office monitoring for the purposes of hypertension diagnosis. Optimising support would help minimise any psychological harms and maximise adherence. Our study could be replicated using an out-of-office diagnostic protocol that resembles current recommended practice (i.e. 7-days of self-monitoring with no telemonitoring or 24-hr ambulatory monitoring).

## **CONCLUSION**

Out-of-office monitoring for hypertension diagnosis does not appear to be harmful, however, in some patients, it induces feelings of anxiety. Controlled studies utilising routine diagnostic protocols are needed to confirm our findings and identify which patient groups are affected.

## **NOTES**

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### **Ethical approval**

Ethical approval was granted by the NHS Research Ethics Committee - Oxfordshire Research Ethics Committee B (Reference: 09/H0605/106).

### **Competing interests:**

None

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## 351 **Contributions**

352 CH, AW, RM, MT and RP conceived and designed the study. DN undertook data  
353 collection. AT analysed the data. AT and DN drafted the manuscript. All authors  
354 commented on the manuscript.

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428 **Table 1.** Characteristics of study participants

	Total cohort (n = 247)			Pre-post Comparisons (n = 140)				Acceptability Comparisons (n = 183)			
	n	Mean (SD)	95% CI	n	Mean (SD)	95% CI	p	n	Mean (SD)	95% CI	p
Age	247	56.2 (9.8)	55.0 to 57.5	140	57.7 (9.8)	56.0 to 59.3	0.01	183	56.4 (9.7)	55.0 to 57.8	0.37
	n	Number (%)	95% CI of %	n	Number (%)	95% CI of %	p	n	Number (%)	95% CI of %	
Female	247	122 (49.4)	43.2 to 55.6	140	77 (55.0)	46.7 to 63.1	0.04	183	90 (49.2)	42.0 to 56.4	0.91
Hypertensive*	203	109 (53.7)	46.8 to 60.5	131	69 (52.7)	44.1 to 61.1	0.69	171	90 (56.2)	45.2 to 60.0	0.48

429 \*Available for completers of the diagnostic study only (mean daytime ambulatory  $\geq$  BP 135 mmHg systolic and/or 85mmHg diastolic)

430 SD = standard deviation, CI = confidence interval

431 p = p-value for comparison with excluded cohort members

432

433 **Table 2.** The proportion of cohort members anxious or depressed at baseline & follow-up assessed using the Hospital Anxiety and  
 434 Depression Scale

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Measure	Baseline			Follow-up		
	n	n, %	p value	n	n, %	p value
Depressed						
Total	139	22 (15.8)	<0.001	136	14 (10.3)	0.018
Male	62	5 (8.1)		60	2 (3.3)	
Female	77	17 (22.1)		76	12 (15.8)	
Anxious						
Total	138	48 (34.8)	0.002	137	37 (27.0)	0.004
Male	62	13 (21.0)		61	9 (14.8)	
Female	76	35 (46.1)		76	28 (36.8)	

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**Table 3a.** Change in HADS depression status (n = 135)

		Baseline			
		Not Depressed		Depressed	
		n	% (95% CI of %)	n	% (95% CI of %)
Follow-up	Not Depressed	112	83.0 (76.0 to 88.6)	9	6.7 (3.3 to 11.8)
	Depressed	1	0.7 (0.1 to 3.4)	13	9.6 (5.5 to 15.5)

**Table 3b.** Change in HADS anxiety status (n = 135)

		Baseline			
		Not Anxious		Anxious	
		n	% (95% CI of %)	n	% (95% CI of %)
Follow-up	Not Anxious	83	61.5 (53.1 to 69.4)	15	11.1 (6.6 to 17.2)
	Anxious	5	3.7 (1.4 to 7.9%)	32	23.7 (17.1 to 31.4)

**Table 3.** Acceptability of different methods of out-of-office blood pressure monitoring (n= 183)

	Self-Monitoring	Ambulatory Monitoring	Paired-Difference	
	Median score (IQR)	Median score (IQR)	Median (IQR)	p
1. It made me anxious	2.0 (1.0 to 5.0)	2.0 (2.0 to 5.0)	0.0 (-1.0 to 0.0)	0.13
2. It disturbs home life or everyday activities	2.0 (2.0 to 5.0)	5.0 (2.0 to 5.0)	-1.0 (-3.0 to 0.0)	<0.01
3. It disturbs sleep	2.0 (1.0 to 3.0)	5.0 (4.0 to 6.0)	-3.0 (-4.0 to 0.0)	<0.01
4. It disturbs work	2.0 (1.0 to 4.0)	4.0 (3.0 to 5.0)	-1.0 (-3.0 to -1.0)	<0.01
5. It was uncomfortable	2.0 (2.0 to 5.0)	5.0 (3.0 to 6.0)	-1.0 (-3.0 to -1.0)	<0.01
6. I felt self-conscious	2.0 (1.0 to 3.0)	3.0 (2.0 to 5.0)	0.0 (-2.0 to 0.0)	<0.01
7. I felt unsure what to do	2.0 (1.0 to 2.0)	2.0 (2.0 to 2.0)	0.0 (0.0 to 0.0)	<0.01
8. There is a lot of waiting around	2.0 (2.0 to 5.0)	2.0 (2.0 to 3.0)	0.0 (0.0 to 1.0)	0.06
9. It worried me knowing my BP	2.0 (2.0 to 5.0)	2.0 (2.0 to 4.0)	0.0 (-1.0 to 1.0)	0.73
10. It was difficult to remember to do it	2.0 (1.0 to 2.0)	2.0 (1.0 to 2.0)	0.0 (0.0 to 1.0)	0.02
11. It was worth the trouble to get accurate readings	6.0 (6.0 to 7.0)	6.0 (6.0-7.0)	0.0 (0.0 to 1.0)	<0.01
12. I felt in control	6.0 (4.0-6.0)	5.0 (4.0-6.0)	0.0 (0.0 to 1.0)	<0.01
13. A good way to save doctor/ nurse time	6.0 (6.0 to 7.0)	6.0 (5.0-7.0)	0.0 (0.0 to 0.0)	0.01
<b>Acceptability score*</b>	2.4 (1.9 to 3.1)	3.2 (2.7 to 3.7)	-0.6 (-1.2 to -0.1)	<0.01

Ratings: 1 = strongly disagree; 2 = disagree; 3 = disagree slightly; 4 = unsure or not applicable; 5 = agree slightly; 6 = agree; 7 agree strongly.

IQR: Interquartile range; \*Acceptability score is the mean of all 13 individual items with scoring reversed for the positive items (11 - accurate, 12 - control, 13 good use of time). Lower scores indicate better acceptability.

450 **Table 4.** Mean acceptability scores for out-of-office monitoring modalities

451

	Little 2002 (16)		Wood 2016 (10)		Lindroos 2016 (18)*		Present study	
	n	Mean (SD)	n	Mean (95% CI)	n	Mean (SD)	n	Mean (SD)
Self –Monitoring	153	2.67 (0.90)	727	2.10 (2.0-2.2)	223	2.20 (0.70)	183	2.50 (0.83)
Ambulatory Monitoring	156	3.88 (0.82)	715	2.90 (2.8-3.0)	223	3.11 (0.93)	183	3.17 (0.90)

452 SD: standard deviation; CI: confidence interval

453 Acceptability score is the mean of all 13 individual items with scoring reversed for the positive items (11 - accurate, 12 - control, 13 good use of time). Lower scores indicate  
 454 better acceptability

455 \*Altered the wording of item 6 from “I felt self-conscious” to “I was more aware of my blood pressure level”

**Table 5.** Comments describing the acceptability of out-of-office blood pressure monitoring (see below for key)

<p><b>BP monitoring made me anxious</b></p> <p><i>"I felt anxious one evening when I had a particularly high [self-monitoring] reading, although the feeling passed quickly."</i> (ID229, M, 61yrs, Anx-, Dep-).</p> <p><i>"I felt I was wearing a bomb with the 24hr BP. No doubt the readings should correspond."</i> (ID285, F, 58yrs, Anx+, HADS Dep+).</p> <p><i>"24hr monitor was very stressful, in my experience. Twice a day home monitoring less so, but still a factor...both systems are in my view hard to live with."</i> (ID220, M, 60yrs, Anx-, Dep-).</p>
<p><b>BP monitoring disturbs home life/ everyday activities</b></p> <p><i>"A largely enjoyable experience...with the twice-daily [self-monitoring] readings becoming part of everyday life!"</i> (ID240, M, 73yrs, Anx-, Dep-).</p> <p><i>"The timing of morning and evening [self-monitoring readings] has been inconvenient and rushed at times"</i> (ID220, M, 60yrs, Anx-, Dep-).</p> <p><i>"The 24-hour monitoring was very disruptive...uncomfortable doing household tasks etc. At one stage I <u>had</u> to drive the car. I couldn't stop when the time came for a reading so very stressful."</i> (ID173, F, 75yrs, Anx-, Dep-).</p> <p><i>"You can do pilates class with one [the ambulatory monitor]! Takes thought."</i> (ID257, F, 48yrs, Anx-, Dep-).</p>
<p><b>BP monitoring disturbs sleep</b></p> <p><i>"I was pleasantly surprised that the night time [ambulatory] monitoring did not disturb me too much."</i> (ID001, F, 59yrs, Anx-, Dep-).</p> <p><i>"I'm afraid I didn't last through the night [with the ambulatory monitor]. I found it impossible to sleep &amp; couldn't see how BP during a sleepless night could be useful."</i> (ID178, F, 64yrs, Anx -, Dep -).</p> <p><i>"I had to stop using the 24hs monitor at 3am in the morning as I found I could not sleep. Every time it activated I woke up"</i> (ID 110, M, 57yrs, Anx-, Dep-).</p>
<p><b>BP monitoring disturbs work</b></p> <p><i>"I work as a farm labourer and found it difficult to work so I had the day off [to undertake ambulatory monitoring]"</i> (ID042, M, 61yrs, Anx-, Dep-).</p> <p><i>"It would have been inappropriate to wear it [the ambulatory monitor] at work so I had to arrange to wear it on a Saturday."</i> (ID148, F, 56yrs, Anx+, Dep-).</p>
<p><b>BP monitoring was uncomfortable</b></p> <p><i>"I didn't realise how uncomfortable the 24-hour ABPM would be...I managed to cope but I imagine some older people would feel quite upset by its intrusiveness."</i> (ID083, M, 60yrs, Anx+, Dep -).</p> <p><i>"Could someone invent a B.P. cuff that fits the shape of the arm and does it need to be so wide? I had trouble with the cuff and monitor I thought it was the way I used it but the GPs staff had the same trouble as I had."</i> (ID261, F, 64yrs, Anx-, Dep-).</p> <p><i>"I can't see any way the [ambulatory] monitor could be made more comfortable or less disturbing: anyway it was only 24 hours"</i> (ID214, F, 77yrs, Anx-, Dep -).</p>
<p><b>BP monitoring made me feel self-conscious - no free text comments</b></p>
<p><b>I was unsure what to do when BP monitoring</b></p> <p><i>"Both devices threw up error codes, which I was not able to interpret or correct. This worried me that there was something wrong with my BP and/or pulse."</i> (ID287, M, 46yrs, Anx-, Dep -).</p>
<p><b>There is a lot of waiting around when BP monitoring</b></p> <p><i>"I am lazy &amp; casual and find the BP [self] monitoring tedious &amp; uncomfortable &amp; takes time which might be used for other things"</i> (ID214, F, 77yrs, Anx-, Dep -).</p> <p><i>"I had to stop what I was doing to make sure it [the ambulatory monitor cuff] didn't slip or twist."</i> (ID215, F, 40yrs, Anx-, Dep+).</p>

<p><b>Knowing my BP when monitoring worried me</b></p> <p><i>"The fact that you can see your [self-monitoring] results can in itself be worrying and I wonder if it would be best if people were only told them later."</i> (ID152, M, 60yrs, Anx-, Dep +).</p> <p><i>"I found the home monitoring very instructive &amp; noticed how much difference stress or relaxation made to my blood pressure."</i> (ID178, F, 64, Anx-, Dep-).</p> <p><i>"I was not able to see the measurements on it [the ambulatory monitor], as it was impossible to get it out from its pouch in time to read it before it disappeared, or it was too dark to see at night."</i> (ID192, F, 70yrs, Anx-, Dep-).</p>
<p><b>It was difficult to remember to monitor my BP - no free text comments</b></p>
<p><b>It is worth the trouble to get accurate readings</b></p> <p><i>"I would say taking your blood pressure over the longer period was a much more accurate way to get [a] true reading of someone's blood pressure, than the 24 hr part of the trial."</i> (ID150, M, 57yrs, Anx-, Dep-).</p> <p><i>"The [self] monitor was so user friendly and completely unobtrusive (apart from 15/20 mins am &amp; pm to use it - which is nothing to get results that might save a life!"</i> (ID051, F, 66yrs, Anx n/a, Dep n/a).</p> <p><i>"I find it very reassuring that my blood pressure from home monitoring seems to be much lower than whenever it has been taken at my GP practice - where I always feel anxious. Hopefully, this will have saved the NHS a long-term prescription!"</i> (ID177, M, 55yrs, Anx-, Dep -).</p>
<p><b>I felt in control when BP monitoring</b></p> <p><i>"The [ambulatory] monitor did the job by itself; no question of the wearer being in control"</i> (ID214, F, 77yrs, Anx-, Dep -).</p>
<p><b>BP monitoring is a good way to save doctor or nurse time - no free text comments</b></p>

KEY: Quotes are identified by study ID number, gender (M: male, F= female), age, hospital anxiety and depression score: anxiety sub-scale at follow-up (Anx), hospital anxiety and depression score: depression sub-scale at follow-up (Dep). + = present, - = absent, n/a = status not available.

## FIGURE LEGENDS

**Figure 1.** Flow diagram of participants enrolled in the study