

# Home & Mobile Health Monitoring of Blood Pressure as an alternative to attending General Practice

## 1. BACKGROUND

Many people are asked to attend their GP or Practice Nurse to have their blood pressure (BP) monitored. They are mostly there for that sole reason and do not benefit in any other way from the visit. It was proposed that use of simple text messaging technology to support people to monitor their blood pressure at home would be every bit as effective, and more efficient for all concerned.

## 2. WHAT WE AIMED TO DO

Over a 90 day period (March to May 2016), we aimed to assess the benefits and challenges of remotely monitoring patients' blood pressure using simple text messaging technology. GPs who agreed to participate were asked to recruit patients to test the BP home & mobile health monitoring (HMHM), either at the point of diagnosis or initiation of medication.

## 3. METHODS

Data was gathered on each study participant from the practices by means of an excel spreadsheet and the data was collated to generate descriptive statistics. Patient experience data was gathered using the text messaging software (Flo) via a set of questions sent automatically 10 days after they opted in. All eligible patients who agreed to participate were recruited, although they were free to opt-out at any time and assured this would not affect their care.

## 4. RESULTS

Following an initial visit by the Programme Manager for training and testing of the study protocols, BP monitors were supplied to 14 practices within 90 days. A total of 115 patients were recruited and nine practices completed the reporting template.

There were slightly more women than men in the study group and the average age was 56 (range 24 to 84). Slightly more of the participants were from South Lanarkshire (n=64) than North (n=51).

### Clinical contacts

The main reasons for monitoring BP were linked to medication and to establish a diagnosis or not (Figure 1). Participants used the BP monitors for varying lengths of time (Table 1).

Figure 1 – Reasons BP monitoring was started

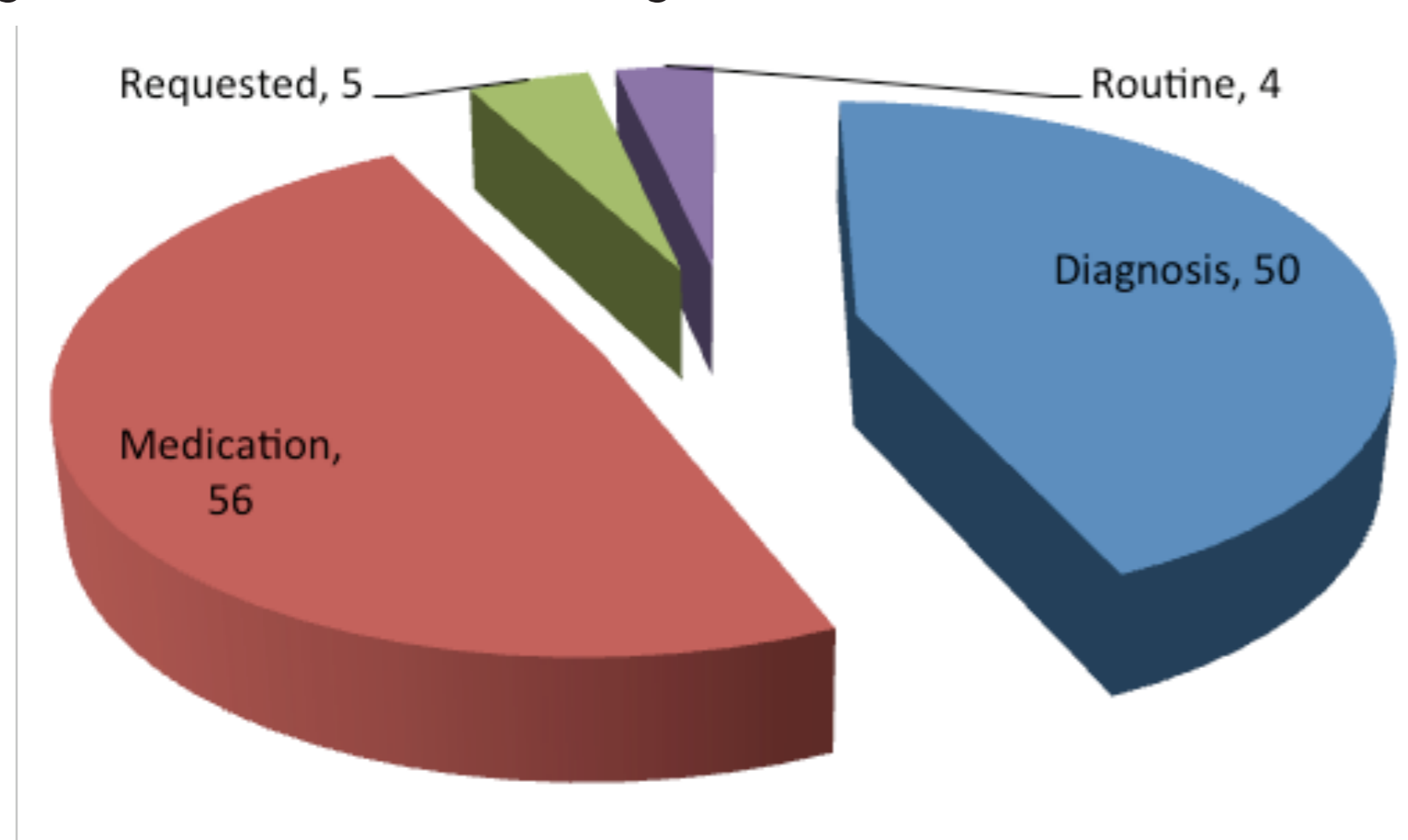


Table 1 – Length of time BP was monitored

Monitoring time (days)	f
0 to 10	31
11 to 20	41
21 to 40	20
>40	7
Still monitoring	15
Not recorded	1
<b>TOTAL</b>	<b>115</b>

The majority of people monitored their BP for less than three weeks, the average being 18 days. One used it for more than the 90 day study period and 15 were still monitoring at the three month point. Since HMHM was replacing the patient travelling to the surgery to have their BP monitored, they necessarily had fewer such appointments (Table 2).

Table 2 – No. contacts avoided by BP HMHM

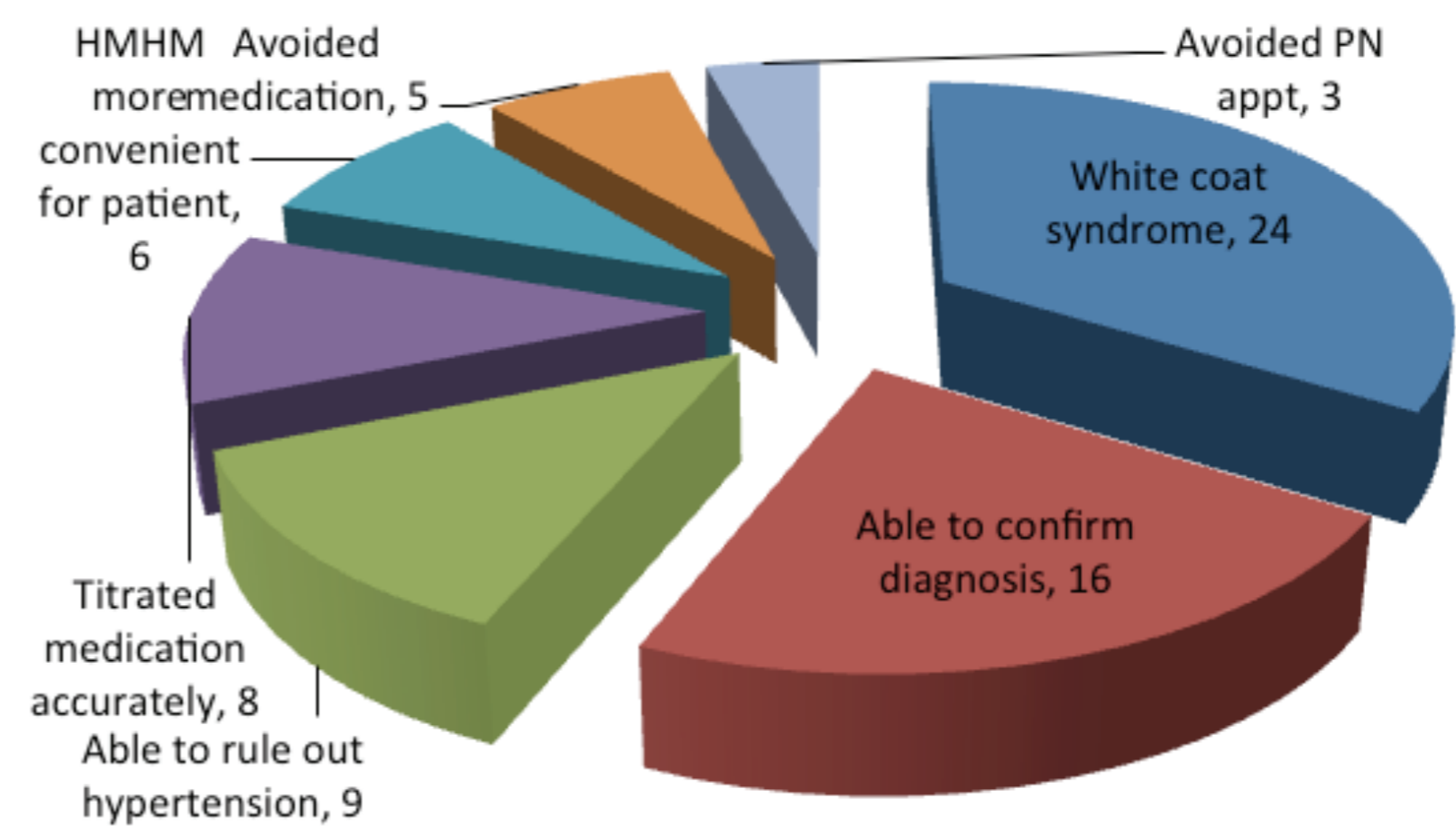
No. face-to-face contacts avoided	f
1 or 2	26
3 or 4	48
5 to 10	15
11 to 20	5
Not recorded	21
<b>TOTAL</b>	<b>115</b>

A total of 416 appointments were avoided, which released considerable patient and clinician time. The average number of contacts avoided by use of the remote BP monitoring was 4.4, the number varying with reason for monitoring and individual circumstances.

### Clinical decision-making

All 103 clinicians who answered the question agreed that monitoring had been an aid to clinical decision-making, the majority feeling that it made this faster. Further explanation is illustrated in Figure 2.

Figure 2 – Further explanation of supported clinical decision-making

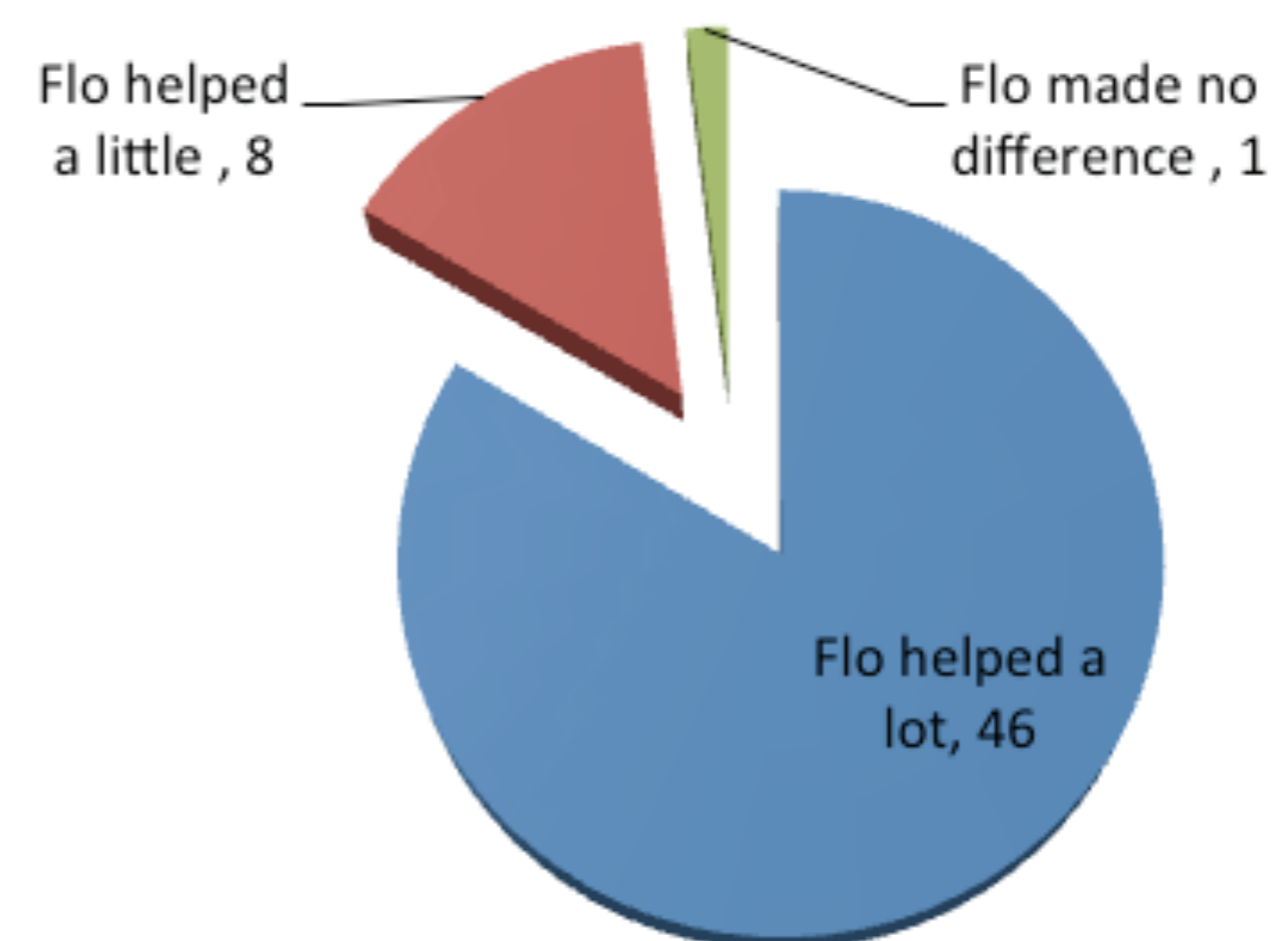


One third of the people who were monitoring their own BP were found to have 'white coat syndrome' which risks mis-diagnosis because blood pressure is only high in clinical settings. In addition to ruling out hypertension, the diagnosis was confirmed in 16 people. HMHM helped to adjust medication dose or avoided the need for medication at all, whilst six people commented how much more convenient remote monitoring was for patients.

### Patient experience

People who had used BP HMHM were sent a series of text messages asking about the experience. A total of 71 out of 72 had no difficulty using the software and the majority thought Flo had helped them monitor their blood pressure (Figure 3). When asked if they would use Flo again, all but three said they would if they needed to.

Figure 3 – Text responses to whether or not Flo helped monitor BP



### What did it all cost?

Average cost = **£3.69 per active patient**

If restrict to new patients recruited, average cost = **£6.72 per new patient**

These calculations do not include the cost of the automated BP monitors

## 5. WHAT DO THESE RESULTS TELL US?

### Home health monitoring (HMHM) of blood pressure improves efficiency

HMHM of blood pressure for about two to three weeks avoids an average of four to five GP or Practice Nurse appointments per patient. This saves clinic time, reduces telephone contact time (using texts instead) and prevents patients having to travel to the surgery for routine monitoring.

### HMHM of blood pressure supports clinical decision-making

GPs/Practice Nurses report that HMHM of blood pressure enables faster decision-making and provides optimum readings. This resolves issues around 'white coat syndrome' (it did so for one third of this cohort) and allows a diagnosis of hypertension to be either confirmed or ruled out.

### People mostly find it easy to monitor their own blood pressure and report results by text

People found the BP monitor and Flo text messaging system easy to use, felt it helped them monitor their BP, and would use it again in future, if they needed to.

### Acknowledgements

Although many people helped with this study, we would like to particularly acknowledge the support of all the GPs and practice staff.