

NHS HEALTH CHECK CASE STUDY

Project title	Simple telehealth management of blood pressure – with subsequent rollout to practices that supports initial high BP reading at NHS Health Check
Topic Area	Chronic disease management

Organisation(s)	NHS Stoke on Trent PCT/CCG
Contact Names	Phil O’Connell; Dr Ruth Chambers
Position of contact	Project lead ; Clinical lead (respectively)
Email	phil.oconnell@nhs.net ; ruth.chambers@stoke.nhs.uk

Summary description of the whole project
<p>Patient self-management/self-monitoring was promoted using an interactive SMS text messaging service to support (i) the effective management of patients with CKD in primary care (preventing deterioration and hospital admission/referral) and (ii) patients with poor blood pressure control at risk of stroke/falls¹. Patients not only submitted data using SMS but also received an automated text response (dependent upon their data) with appropriate action/s. The system also allowed for professional oversight by practice nurses accessing BP readings texted to the project website and health promotion messages relating to BP recording and management to be sent using SMS at regular intervals.</p> <p>Once we had proved the benefits of this interactive messaging service and approach, we made it available to all general practices in Stoke on Trent to offer to patients who have an initial high BP reading detected at the NHS Health Check, to provide home BP readings to clarify whether the patient does have hypertension or not.</p>

Why was the project undertaken?
<p>Hypertension is asymptomatic but has serious cardiovascular and renal consequences. NICE highlights that untreated or inadequately treated hypertension can perpetuate and exacerbate the cardiovascular and kidney problems, potentially leading to a ‘treatment-resistant state’.² However, hypertension is</p>

¹ Wilson et al 2010.

² National Institute for Health and Clinical Excellence. *Hypertension: clinical management of primary hypertension in adults*. London : NICE, 2011. CG127.

usually asymptomatic but the medication used to treat it often lead to side effects. This can limit concordance with management plans, and, if not correctly titrated, can also lead to significant adverse effects such as negative effects on quality of life, dizziness, falls and fractures. Accurate detection and management of hypertension is essential to reduce morbidity and mortality among patients and to prevent unnecessary use of NHS resources in managing the adverse effects of inadequate detection or monitoring of this condition. Although all this is known, management of blood pressure is inadequate to maximise patient safety and reduce morbidity.³

‘White coat syndrome’ is a recognised phenomenon that results in elevated blood pressure readings in the healthcare setting compared to those that would be obtained in from the same patient in their usual environment. If undetected, white coat syndrome could result in unnecessary treatment of falsely elevated blood pressure readings which, in turn, increases the risk of adverse effects from antihypertensive medication, such as falls and subsequent fractures. Therefore repeated blood pressure measurements in the patient’s home environment is now advised prior to diagnosis of hypertension (1) and is thus also desirable to monitor response to antihypertensive medication.

Telehealth is being increasingly used to assist patients and the healthcare professionals responsible for their care to monitor medical conditions. However, equipment for more complex telemonitoring can be costly. As hypertension is such a common problem and its management only requires monitoring of blood pressure, rather than multiple parameters, a simple technology that can be easily and efficiently rolled out across a large number of people is required.

What were the aims of the project?

We hoped to:

- Improve blood pressure control and management of CKD Stages 3 and 4
- Improve patient self-management and outcomes
- Reduce hospital outpatient referrals and admissions for deterioration of CKD from Stage 3 to Stage 5
- Reduce hospital admissions from stroke/falls

What are the demographics of the local health community?

Given the demographic and health profile of the local population within parts of Staffordshire⁴, the management of blood pressure for (i) CKD patients and (ii) those at risk of stroke and/or falls is a key priority and integral to core programmes focusing on self-management and health improvement for NHS Stoke-on-Trent. Of the 275,000 people registered as patients in Stoke, 28,000 are diagnosed with diabetes, CHD, hypertension or CKD stages 3, 4 or 5 with many more undiagnosed. The area has high levels of material deprivation and poor health. Stoke on Trent is the 11th most deprived Local Authority

³ Duggan, S, et al. *Management of older patients with hypertension in primary care: improvement on the rule of halves*. s.l. : British Geriatrics Society, 2001, Age and Aging, Vol. 30, pp. 73-6.

area in England; 58 of its 60 wards are significantly deprived. Ten general practices volunteered to participate in the project and trial telehealthcare.

How did organisation(s) go about planning for the project?

GP practices from NHS Stoke-on-Trent were approached by the Steering Group via a local learning event and were asked if they wish to volunteer to participate in this programme of simple telehealthcare. In each practice that volunteered to take part, a 'practice champion' was recruited to promote local leadership. Practices who were involved were paid a notional incentive for participation to assist with the funding for the administration work involved, particularly with the evaluation of the project. Practice staff received training in the use of Florence (or Flo' – the SMS texting mobile phone telehealth service relaying interactive messages and information between patient and the responsible clinician).

We developed the clinical protocol for this simple telehealth mobile phone texting system in line with NICE guidance, that gave practices confidence in the outputs of the telehealth usage. Such clinical protocols act as fundamental building blocks to secure clinical engagement.

Practices that wished to take part were asked to recruit 20 to 50 'intervention' patients who fulfilled one of two criteria and would use the simple telehealth service:

- 1) Patient has CKD Stage 3 or 4 with a BP persistently >130/85mmHg
- 2) Patient is >65 years old (without CKD stage 3, 4 or 5) and has a BP persistently >140/90mmHg despite prescribed antihypertensive medication – the age for this criterion was subsequently reduced to 50 years to improve ease of patient recruitment

For each intervention patient, practices were asked to select three 'control' patients who were approximately matched, primarily according to the reason for the intervention patient's inclusion, age and gender. Practices were asked to recruit patients between April and November 2011.

Practice staff trained the recruited intervention patients on taking their own blood pressure and submitting their readings to Florence.

How did the organisation(s) implement the project?

10 practices recruited 124 patients. Patients were recruited according to the two criteria given above but also practices enrolled patients if their diagnosis of hypertension were uncertain.

What budget and resources did they need to implement the project?

Equipment/delivery of 3 month period telehealthcare

- Assuming that a blood pressure monitor will be used for three patients per year over two years and the average period of use is 12 weeks, the cost per patient is around £5 (for 6 patients to

use in that 2 year cycle)

- Assuming practice nurse costs circa £25 an hour including management costs, then 2 minutes a week per patient for 13 weeks period = around £12 per patient (or £24 a patient if overview continues for 6 months)
- Mobile phone texts for project = 8 pence a text; averaging 10 texts per week for 13 weeks (maximum) = £10.40; for 6 months = £20.80

Total running costs for 12 weeks review period per patient = £27.40

So for the 124 patients, total equipment & delivery costs were £3,397.60

What evidence base did they use?

The evidence for this approach came from individual studies utilising various technologies for a number of different conditions.^{5,6,7,8,9,10,11,12} The approach being used here was novel and thus there was no evidence that could be directly extrapolated to this project.

What outcomes/improvements did they achieve?

124 patient participants (and 364 controls) were recruited by ten practices, of whom all but eight patients completed six months on the programme. The average length of use of *Florence* telehealthcare was 78 days (median 87 days).

Improved blood pressure control: Significantly greater numbers of BP readings were obtained by

⁵ **Maric, B, et al.** *A systematic review of telemonitoring technologies in heart failure.* 5, 2009, Eur J Heart Fail, Vol. 11, pp. 506-17.

⁶ **Jerant et al** *Reducing the cost of frequent hospital admissions.* 2001, Medical Care, Vol. 39.

⁷ **Meystre, S.** *The current state of telemonitoring: a comment on the literature.* 1, 2005, Telemed J E Health, Vol. 11, pp. 63-9.

⁸ **Benatar, D, et al.** *Outcomes of chronic heart failure.* 2003, Arch Intern Med, Vol. 163, pp. 347-52.

⁹ **Louis, AA, et al.** *A systematic review of telemonitoring for the management of heart failure.* 5, 2003, Eur J Heart Fail, Vol. 5, pp. 583-90.

¹⁰ **Delgado-Passler, P and McCaffrey, R.** *The influences of postdischarge management by nurse practitioners on hospital readmission for heart failure.* 2006, J Am Acad Nurse Pract, Vol. 18, pp. 154-160.

¹¹ **Chaudhry, SI, et al.** *Telemonitoring for patients with chronic heart failure: a systematic review.* 1, 2007, J Card Fail, Vol. 13, pp. 56-62.

¹² **Clark, RA, et al.** *Telemonitoring or structured telephone support programmes for patients with chronic heart failure: systematic review and meta-analysis.* 2007, BMJ, Vol. 334, pp. 942-5.

patients using *Florence* than those receiving usual care compared with controls for the same three months. Overall, patients using *Florence* demonstrated a greater average and significant reduction in systolic blood pressure, compared with their associated controls, in months one, two and three of the programme -for more details see <http://bmjopen.bmj.com/cgi/content/full/bmjopen-2012-001391> or www.nice.org.uk/usingguidance/sharedlearningimplementingniceguidance/examplesofimplementation/eximpresults.jsp?o=617 Significantly more changes were made to the medication of participating patients, compared with control patients over their 6 month inclusion in the programme.

Improved patient self management: Patients found the system easy to use, were very satisfied about the feedback from their GP regarding their BP readings, found the advice sent via *Florence* useful and preferred to send BP readings using *Florence* rather than having to go to the doctors monthly to get BP checked.

No participating patient suffered from stroke/TIA or hip fracture during the six months they were involved in the programme; but five control patients and **no** participating patients experienced falls during the six months they were involved in the programme, which might indicate improved blood pressure control in participating patients.

What cost savings did they achieve?

The project period was too short (6 months) to demonstrate reliably reduced usage of secondary care from the improved blood pressure control we achieved by the use of *Florence*. But, with the actual delivery costs for the 124 patients on a 3 month programme being £3,397, we probably saved one patient with CKD Stage 4 from deteriorating to Stage 5 necessitating dialysis – with cost savings of at least £30,800 per year. There were other savings too, such as avoided consultations at the GP surgery - plus saving patients' travel costs and time; practice staff consultation time; and possibly avoided fractures from falls.

Supporting information and documentation (please reference and acknowledge any documents you use)

Cottrell E, Chambers R, McMillan K. A cross-sectional survey and service evaluation of simple telehealth in primary care: what do patients think? *BMJ Open*. 2012;2:e001392.doi:10.1136/bmjopen-2012-001392 Available at <http://bmjopen.bmj.com/content/2/6/e001392.full>

Cottrell E, Chambers R, O'Connell P. Using simple telehealth in primary care to reduce blood pressure: a service evaluation. *BMJ Open*. 2012;2:e001391 doi:10.1136/bmjopen-2012-001391 <http://bmjopen.bmj.com/content/2/6/e001391.long>

NICE shared learning example:

www.nice.org.uk/usingguidance/sharedlearningimplementingniceguidance/examplesofimplementation/eximpresults.jsp?o=617

Case study 1:

"[A 60 year old man] thought that using the Florence system made him feel that he had a strong support from his GP and that it was a really worthwhile illustration of the quality of NHS service."

Case Study 2:

“[A doctor involves recalls that she] had just finished texting her instructions to a patient informing him that he would need a prescription following his blood pressure result – she took the prescription out to reception within 5 minutes of sending the message, and he was already standing there waiting for the prescription, having jumped into his car and driving to collect it!”

So how can you utilise Florence telehealth service in your local area?

Take a look at the Florence website www.stoke.nhs.uk/simple to read more about the options for applying the Florence telehealth service. We have a national rollout across the country – Advice and Interactive Messaging (AIM) for Health. Participating practices/CCGs are being offered a choice of taster clinical protocols for hypertension (initial high reading; poorly controlled), smoking cessation (on smoking cessation programme or just quit), asthma inhaler reminders, medication reminders, the new DES for remote monitoring of long term condition (when confirmed). But others are available of relevance to follow up after the NHS Health Check – obesity/weight management, alcohol misuse, contemplating stopping smoking. For more details about how your CCG can adopt the Florence telehealth service please email Phil O’Connell or Dr Ruth Chambers (see contact details at start of case study).

Acknowledgements

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