



Flo Simple Telehealth Evaluation Report 2013/2014



The photograph above of our Team was taken when we hosted a visit in May 2014 from colleagues who work at the Veterans Health Administration, USA. Robin Hood and Maid Marion popped into welcome them to Nottinghamshire!

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Acknowledgements to the input provided by the Workstream Team and clinical advocates, services/practices for returning data and engaging with Flo. Also to research colleagues Audrey Cund, Professor Patricia Connelly and independent consultant Martin Kay for their support and input.

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1. Executive Summary

Florence™ or 'Flo' as is an NHS owned simple telehealth solution designed to provide advice and support for patients to manage their own conditions better. Its inception in primary care has seen an evolving range of protocols and uses spread to other health and social care sectors through natural innovative growth from clinicians' ideas and vision.

Flo can monitor vital signs such as blood pressure, pulse, weight and oxygen levels and gives the patient control through use of their own mobile phone. Flo can also offer advice and support based on clinically approved protocols designed and developed together with the Assistive Technology workstream team.

This paper provides an insight into 12 months of using Flo across Nottinghamshire health and social care organisations. The data covers the second business case (2013/14), after a successful deployment in a Heart Failure service which started in November 2012. By the end of March 2014, 801 patients had been enrolled onto Flo locally.

The purpose of this paper is to present a transparent analysis of results and outcomes of the data collected over the 12 months. Lessons learned and recommendations to improve evaluation data and collection in 2014/15 are also presented. Identification of challenges and how these can be addressed over the next year are also reviewed.

Flo is in widespread use across every CCG across Nottinghamshire and is demonstrating some very positive outcomes; however it is not universal in its use and spread. Further deployments are required to show true potential to support current challenges faced by health and social care services to continue to support the integration of health and social care delivery, including input from patients and carers.

Amanda Sullivan, Chief Officer - Mansfield and Ashfield /Newark and Sherwood CCG's & Nottinghamshire AT Workstream Executive Lead

At the inception of this Workstream back in April 2012, I classed myself a cynic in terms of Telehealth. Our journey through comprehensive business case planning, initial rollouts, and lessons learned, analysis of outcomes and hearing powerful patient stories has changed my view.

The bespoke nature of Flo offers wide ranging support to services to increase their productivity, while increasing the quality of care and making better uses of NHS and social care resources. Flo supports the whole health and social care pathway and offers an effective tool to deliver integrated care and enable patients to self-manage in a supported manner.

Flo was identified as an effective QIPP programme and this evaluation identifies some clear quality, clinical and cost benefits, for a relatively low investment. It provides us with a cost effective and efficient platform to build on, with new functionality continually being developed. The system has an extensive spectrum of uses that will assist us in driving and enhancing the changes required if we want to see our care delivery remain at a high sustainable standard.

Dr Nigel Marshall, GP and Nottinghamshire AT Workstream Clinical Lead

2. Academic Commentary

A rise in the number of long term conditions and an ageing population have been cited over the last decade as the key drivers and imperatives for change in health and social care services in the UK¹. A number of strategies to reduce the burden of long term illness have been driving forward innovations across the UK; examples include the expert patient programmes², the use of community matrons³ and the use of Telehealth and Telecare to assess, diagnose and monitor conditions at home or at a distance from a health and social care provider⁴⁵⁶.

More pointedly, the subject is now firmly embedded in UK Government discussions on the future provision of healthcare and the need to adapt to a changing landscape as show, for example, by the Parliamentary Office for Science and Technology Report No. 456 February 2014 “Telehealth and Telecare” indicating the drivers and barriers. .

The NHS itself is struggling to implement the changes in clinical practice and attitude that will reap the full benefits of telehealth but this is not to say that the subject should not be tackled. Focus has moved to infrastructure support, commissioning and the challenges thereof⁷.

The current report focuses on the practical implementation of Flo in a community setting, reporting on experience of implementing Flo for key chronic conditions that might benefit from more frequent monitoring. The report is thorough but its findings are affected by many of the challenges of implementing telehealth at this stage that have been reported throughout the sector namely: -

- Patients numbers are low so benefits of scale do not emerge
- Clinician acceptance to telehealth is mixed and so where a nurse team or GP practice are reluctant then the findings are often minimal
- Data reporting from GP surgeries can be difficult depending on the database and cost base that can be accessed, masking true benefits

¹ Christensen, K., Doblhammer, G., Rau, R., Vaugel, J. Ageing population: the challenges ahead, *The Lancet*, 2009, Vol. 374, Issue 9696, 1196-1208

² Reeves, D., Kennedy, A., Fullwood, C., Bower, P., Gardner, C., Gately, C., Lee, V., Richardson, G, Rodgers, A. Predicting who will benefit from an expert patient s programme self-management course, *British Journal General Practice*, 2008 58, 548, 198-203

³ Randall, S., Daly, G., Thunhurst, C., Mills, N., Guest, D. A., Barker, A. Case management of individuals with long term conditions by community matrons: report of qualitative findings of a mixed method evaluation, *Primary Health Care Research & Development*, 2014, 15: 26-37

⁴ Department of Health Digital Health Strategy, 2013 <https://digitalhealth.dh.gov.uk/digital-strategy/executive-summary/> [accessed on 18/03/14]

⁵ Scottish Government, A National Telehealth and Telecare Delivery Plan for Scotland to 2015: Driving Improvement, Integration and Innovation (online), 2013 <http://www.scotland.gov.uk/Publications/2012/12/7791/2> [accessed on 4/12/13]

⁶ Welsh Government, More than just words: A Strategic Framework for Welsh Language Services in Health, Social Services and Social Care, 2012. Cardiff. Welsh Government.

⁷ Tackling Telehealth, Inside Commissioning Report, March 2014

Having said this, it is clear in the report that there are benefits in each condition studied even with low numbers. Key areas that show the potential for marked improvements via Flo are in COPD, Hypertension and Diabetes. It is also clear across all conditions that patients see the use of Flo as something that is helping them to manage their condition better. This means that long term benefits in mortality, disability and QALYs should emerge but cannot be captured on the time scale of this report. In fact the Parliamentary Report mentioned above highlights these areas as the missing datasets for telehealth studies.

This study is a good example of how a local health and social care community can work to modernise its practice through a focused telehealth team. The report adds good evidence to the body of work in this field and in particular it highlights the need for clinician buy in, local champions and a continuous education approach in this field to ensure the clinical staff feel informed and supported. A selection of the data and findings from this work has been analysed and written up for publication and submitted to the online, open access, international journal 'Nursing: Research and Reviews' by a joint Nottinghamshire – Strathclyde author team.

Finally, those reading this report should be cognisant of the 'patient power' factor that is emerging in telehealth with large and growing use of health apps on smartphones⁸ and a move into health monitoring by the key providers of smart technology to consumers by powerful and successful commercial entities such as Apple. Thus, although today the current report shows the hard work required by the telehealth implementation teams in the NHS, we can expect patient demand to be one of the key supports in future programmes.

Professor Patricia Connolly
Director, Strathclyde Institute of Medical Devices
University of Strathclyde
Glasgow.

⁸ European Directory of Health Apps 2012-2013 A review by patient groups and empowered consumers.
g3ict.org/download/p/fileId_955/productId_265

3. Background

The Assistive Technology (AT) workstream was established in 2012, as part of the Productive Notts Programme of Work. The workstream is now delivering its third business case, progressing well in line with the objectives set. Over 900 patients have now been enrolled onto Flo with further targets identified to increase this as it becomes normalised.

The team has gained national recognition for their good practice in terms of implementing Flo, clinical engagement and innovative ways of using the system to support numerous clinical services and individual patients. We have been shortlisted for the 2014 HSJ Value in Healthcare Awards within the "Value & Improvement in Telehealth" category. In addition two of our Flo clinical users were successful in becoming NHS England clinical advocates as part of collaboration between the NHS and Veterans Health Administration in the USA.

A recent publication includes Nottinghamshire as a case study⁹, describing the approach taken locally to identify clinical, patient and commissioning requirements in relation to the benefits of telehealth. Further papers with an emphasis on the commissioning process have also been published^{10,11}. A clinical paper in the nursing press is also in the process of being accepted for publication.

The aims of the 2013/14 Business Case was:

- Implementation and mainstreaming of Flo Simple Telehealth
- Evaluation of other Assistive Technologies
- Development of Robust Telehealth Outcome Measures

This evaluation only covers the first aim. An independent interim review was conducted to provide data for the 2014/15 business case in October 2013. The review caveated the limitations of the data available (n= 68), therefore the figures presented were classified as indicative rather than true outcome data. The author made the following observation and its relevance continues:-

"Outcomes in relation to long term conditions are difficult to generalize upon, given the very individual nature of each patient's care and disease progression. To illustrate this, when analysing the outcomes of a routine surgical procedure, there is a clear pathway that the patient is expected to follow and therefore there are clear outcomes which can be measured and compared. In caring for LTC patients, they do not follow specific pathways and often have multiple co morbidities and therefore uniqueness has to be taken account of. The Hawthorne effect¹² should also be considered" (Kay, 2013).

Data in this report covers 118 patients and for some cohorts, validates the findings of the interim review.

⁹ Birch-Jones, J (2014) "Tackling Telehealth: How CCGs can commission successful telehealth services" Case Study: How Nottinghamshire CCG's are tackling telehealth. pg 10.
http://offlinehbpl.hbpl.co.uk/NewsAttachments/GCC/Inside_Commissioning_Tackling_Telehealth.pdf

¹⁰ Birch-Jones, J (2014) "How CCGs can use 'speed-dating' to successfully commission new services"
<http://www.insidecommissioning.co.uk/article/1297822/ccgs-use-speed-dating-successfully-commission-new-services>

¹¹ Birch-Jones, J (2014) "How a patient champion can help spread telehealth innovation"
<http://www.insidecommissioning.co.uk/article/1298274/patient-champion-help-spread-telehealth-innovation?HAYILC=TOPIC>

¹² Parsons, H. M. (1974). "What happened at Hawthorne?: New evidence suggests the Hawthorne effect resulted from operant reinforcement contingencies". *Science* **183** (4128): 922–932

4. Methods

This evaluation analysed outcome data identified by clinicians as part of individual project plans which were agreed prior to service go lives. Whilst these vary, the main outcome measures used were:-

- Patient increased compliance, self-care and understanding of condition
- Better utilisation of NHS resources
- Admission avoidance
- More appropriate clinical contacts
- Increased proactive and timely care management
- Reduction in unnecessary medication and related costs

Quantitative and qualitative data was collected via patient and clinician questionnaires at various points in the patient pathway (see appendix A). This varied depending on the timescale Flo was being used for.

Where felt to be clinically appropriate, further qualitative analysis was undertaken and this data is presented in the form of individual patient case studies.

Quantitative data was also collected via clinical systems. 12 months pre and post Flo data was used to provide comparative analysis. Caution needed to be applied to some cohorts because within some services other changes were introduced; therefore outcomes cannot be wholly attributed to the use of Flo.

Quantitative data was analysed within Excel. No statistical analysis was carried out given the small numbers of patients which it was felt would not result in statistically significant results. However the data does provide indicative outcomes which can be validated in the future as data increases.

It is also worth noting that Flo was deployed during a year of great organisational change and restructure as the CCGs became legal entities.

5. Results

Of the 660 patients who used Flo during 2013/14, complete data was available for 118 patients, some of whom continue usage.

The results have been analysed and are displayed on an individual cohort basis to illustrate the variation of usage and approach by different teams. Results are overwhelmingly positive from a patient, clinical and service perspective. There were very few negative findings, all of which are presented in this report. Common themes related to lack of patient education, unsuitable individualised vital sign parameters and overambitious expectations, for example patients thinking Flo would cure their hypertension.

The use of Flo has been communicated widely across the Local Health Community (LHC). Implementation has been delivered in an equitable approach, with the team supporting all services who have expressed interest in utilising the system. There has been significant variation in take up, in terms of organisation and services.

Whilst the initial focus was on primary care, community services have been much more proactive in introducing Flo. However a proactive targeted approach to General Practices has had a significant impact on

take up. Latterly this approach is no longer required; services are contacting the team as a result of hearing about Flo from their peers.

Table 1 – Flo usage by organisation (2013/2014)

| Organisation | Number of Services |
|---|--------------------|
| CHP | 15 |
| N&S CCG | 12 |
| M&A CCG | 11 |
| Nottingham North East CCG | 8 |
| SFHFT | 5 |
| Rushcliffe CCG | 4 |
| NHCT | 3 |
| BHP | 2 |
| Nottingham West CCG | 1 |
| New Leaf | 1 |
| Nottingham City CCG | 1 |
| Primary Integrated Community Services Ltd | 1 |
| NUH | 1 |
| Gypsylife | 1 |
| Nottinghamshire County Council | 1 |
| Nottingham City Council | 0 |

In order to spread adoption of Flo, Gladwell’s¹³ Diffusion Model has been applied. This resulted in achieving high number of implementations in services who consistently utilised innovative new ways of working, followed by other services that are more comfortable as late adopters. A move from the early adopters in some areas to the early majority has occurred, however caution is needed to sustain this momentum. Innovations do not slide effortlessly from one group to the next. There are many examples of other services/projects that fail and do not make it past early adoption. To avoid this, we need key individuals to identify the chasm between the two and to make the innovation make “perfect sense” to the majority (Gladwell)¹⁴. One of the solutions to this is the ability to provide evidence of improvement in patient care outcomes and quality of care in larger numbers. As the use of Flo increases, this evidence will become available and early data will be validated.

¹³ Gladwell, M (2000) *The Tipping point; how little things can make a big difference*. ISBN-10: 0349113467 p196

¹⁴ Gladwell, M (2000) *The Tipping point; how little things can make a big difference*. ISBN-10: 0349113467 pp. 197-200

Individual patient cohort evaluations

Section 5.1 Chronic Obstructive Pulmonary Disease (COPD)

5.1.1. CHP Newark & Sherwood COPD Team

This team were one of the first to go live with Flo back in January 2013, to monitor Oxygen saturation levels with an additional question relating to sputum, cough and breathlessness as required. Age range =59 – 80 with average age 70 years old.

Table 2 – COPD summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|---|---|---|
| 21 (Clinical data) 16 (qualitative evaluation returns) | £74.96 | <ul style="list-style-type: none"> Reduced anxiety levels were reported anecdotally by clinician and patient. Slight reduction in visits. 40% decrease in Expected Hospital Admissions therefore detecting earlier signs of deterioration. |

Table 3 – Expected outcomes and key results

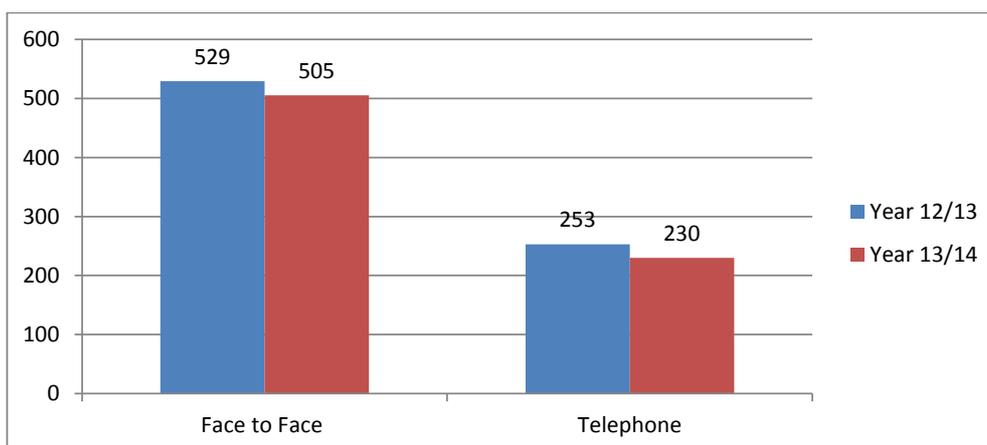
| Expected Outcomes | Findings |
|--|--|
| Provide a productivity gain for COPD nurses, due to reduced number of visits and telephone calls | Data was reviewed for the number of visits/telephone calls in the clinical system. Clinician appropriateness of contacts was also evaluated in the questionnaires. Graph 1 highlights a slight reduction in visits and telephone calls. Graph 6 highlights appropriateness of contacts with a larger number of patients than less appropriate. |
| Access to an increase in monitoring information which provides more proactive and timely care management which should reduce exacerbations and therefore avoid hospital admissions | Hospital admissions/GP Visits and Hospital admission avoided is evidenced in Graph 2 with a 40% decrease in expected hospital admissions and an increase in GP Visits avoided through supporting via Flo. |
| Patient increased reassurance, self-care and awareness of SATs which may lead to decreased anxiety using HAD score | Patient reported outcomes of reassurance are shown in Graph 3 in specific response 10. In Graph 7 SATs data was available for 12 patients who had been using Flo for 12 months and highlights stabilisation and/or improvement. One of the first patients to use Flo also discussed their view in a video commissioned by CHP ¹⁵ |
| To monitor COPD, so that medication can be titrated and reduce exacerbations | SATs readings monitoring are increased as the team have access to more data and therefore medication can be titrated more quickly in order to reduce exacerbations. For all the patients where data was available for 12 months pre and post Flo their average SATs readings remained the same or improved. |

¹⁵ <http://www.youtube.com/watch?v=A3w9rkS6jec>

Graph 1 shows no significant reduction overall in contacts as shown below just 5% however reviewing individual patient data for some patients there is a significant reduction in contacts and others a significant increase.

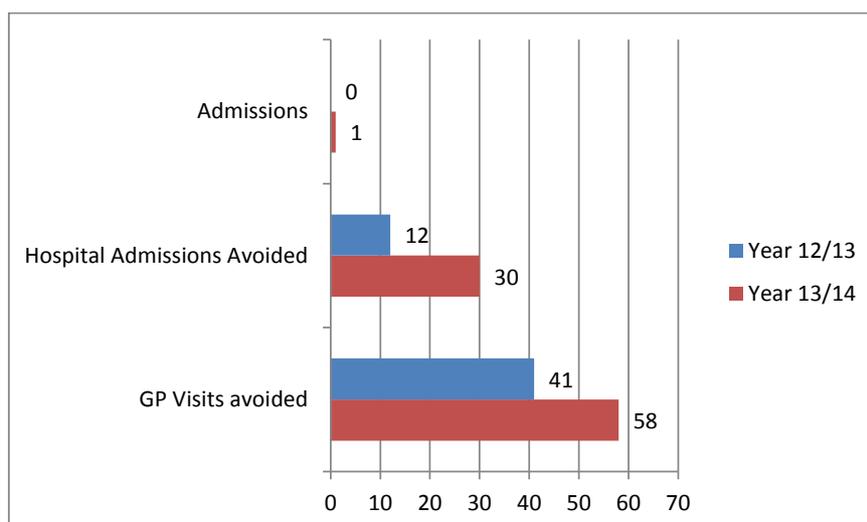
There are explanations for this, COPD is complex and a very personal disease with patients at different stages of need and when you look at clinicians feedback they often indicate feeling a small reduction in contact but that contacts are more appropriate. Overall the data shows a productivity gain.

Graph 1 – Number of face to face contacts and telephone calls (n=21)



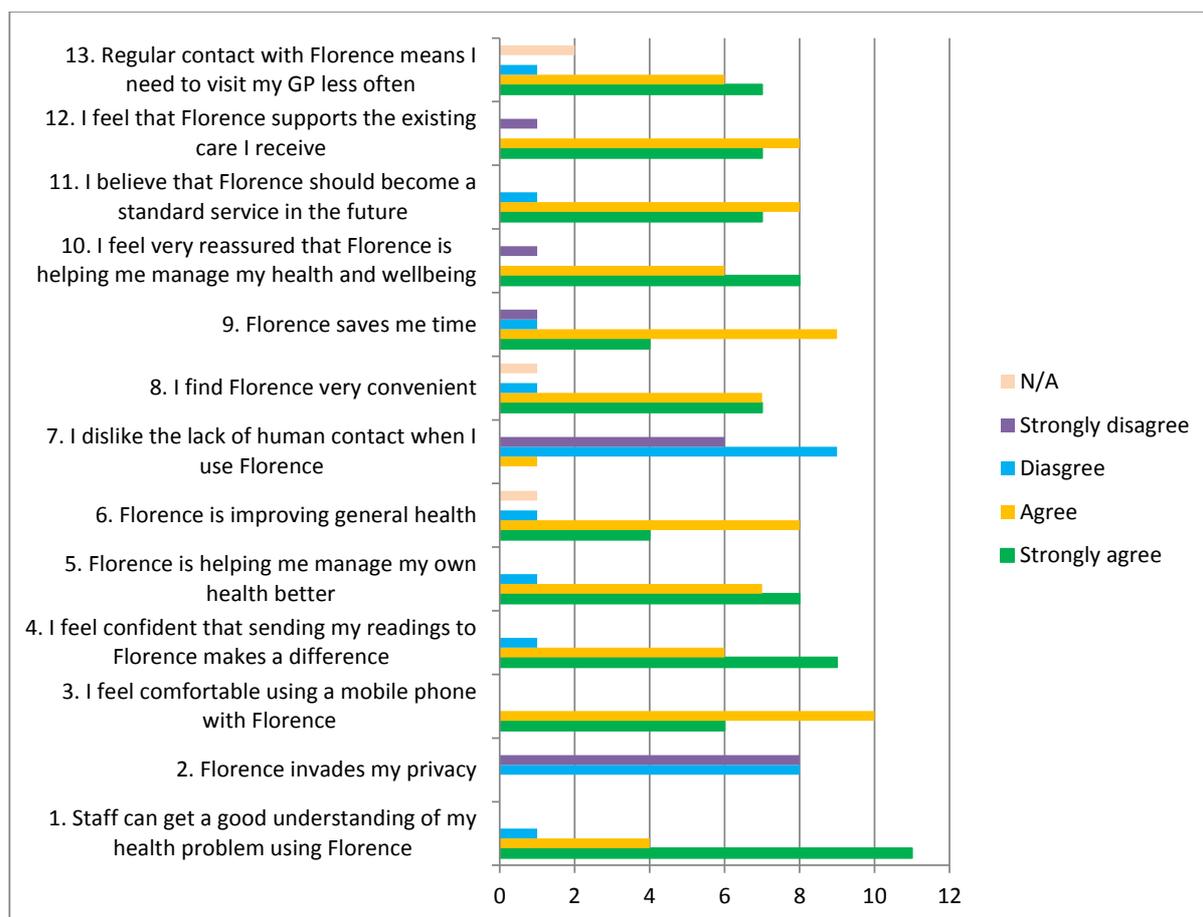
Graph 2 - Hospital admissions/GP Visits and Hospital Admissions Avoided (n=21)

The significant difference here is the reported admission avoidance which may indicate that Flo is facilitating the detection of early signs of deterioration which is being treated in a timely manner.



Graph 3- Patient reported outcomes (n=16)

Patients were asked to complete an evaluation questionnaire (see appendix A). Out of 16 patients, 14 reported agreeing that Flo was helping them manage their own health better and the same number reported feeling reassured.



One patient who had used the landline version of Flo responded without completing the evaluation form stating the following:

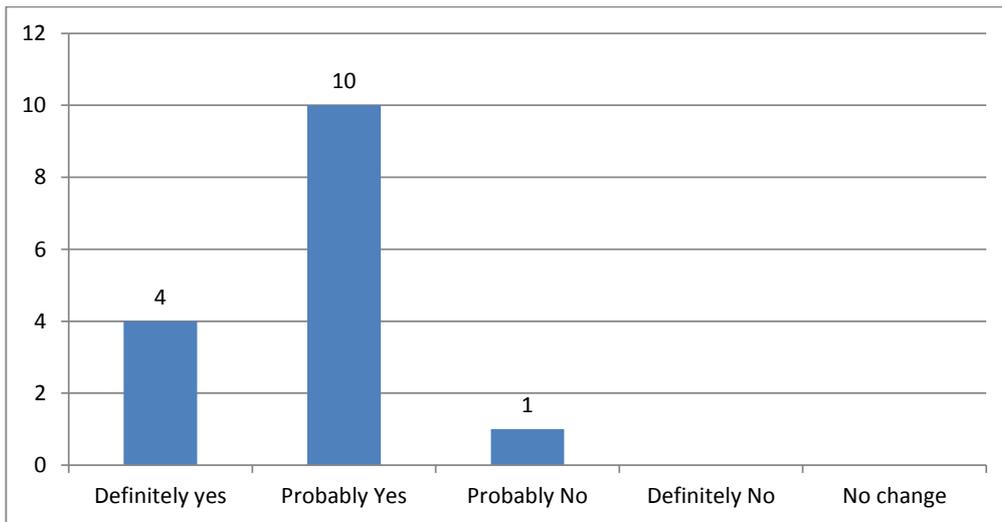
“I have used the Florence and disagree is a strong word I am sure some people find it very useful, that’s why I haven’t answered the Questions because I don’t think it is helpful to me but it may be very reassuring for some people. I didn’t find it invasive but it was just something else to feel guilty about when I went out and forgot and it became a chore thank you for the opportunity to try”.

Another gentleman did not manage to grasp texting and decided it wasn’t for him.

Graph 4 – Ability to Self-manage (n = 15)

The following was asked of the clinician and for the vast majority felt it had helped the patient manage their own health through self-care management of their condition

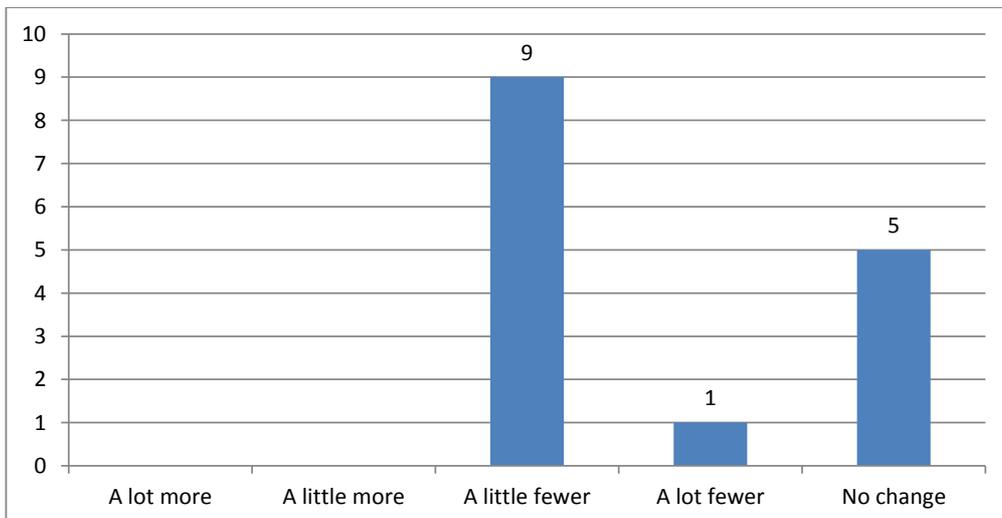
“Do you believe that using Florence has helped this patient to manage their own health and wellbeing better?”



Only 1 patient felt that Flo didn't support their needs and actually increased anxiety.

Graph 5 – Number of Contacts (n =15)

“Have you had more or fewer contacts with this patient since they started on Flo?”



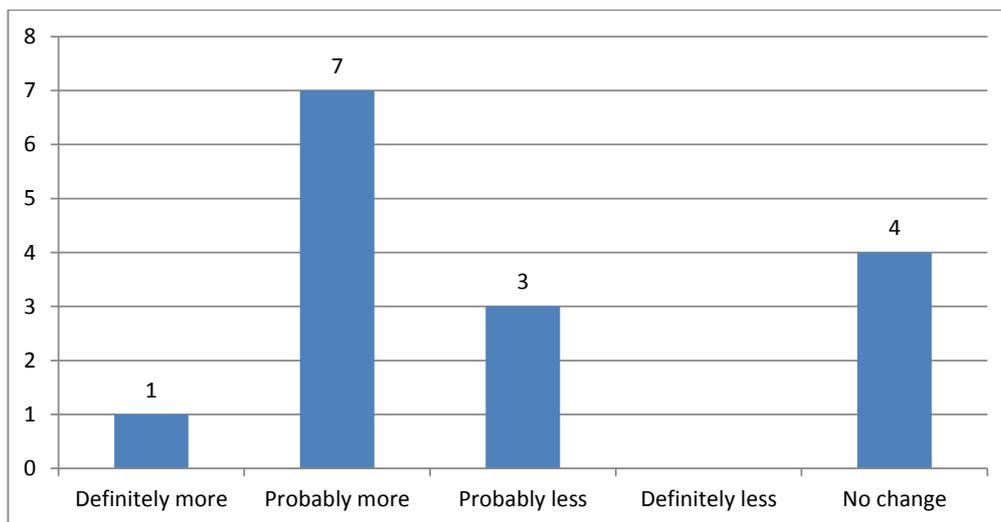
The results varied dependent on patient and the willingness of the clinician to allow true self-management.

Clinician feedback highlights an important point about nurse’s observations about their own behaviour and letting go to support patients to self-manage.

“There is a culture change that clinicians need to go through. This means we have to stop unnecessary visits to patients and allow Flo to support patients on our behalf”
COPD Nurse

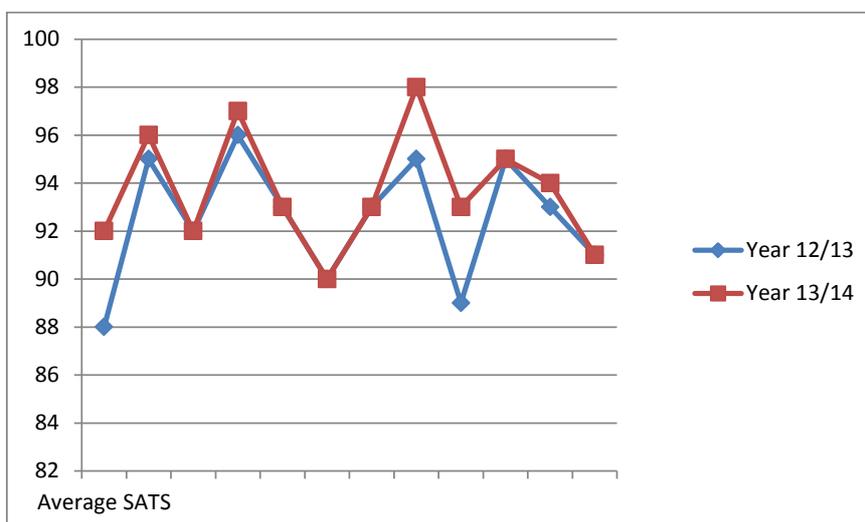
Graph 6 – Appropriateness of contacts (n = 15)

“Have your contacts with this patient been more or less appropriate since they started on Florence ?”



This varies between individual patients and further individual analysis of their conditions and ability to manage their condition would provide further insight.

Graph 7 –Average SATs readings pre and post Flo (n = 12)



Data was available for 12 of the patient’s for a 12 month period pre & post Flo. Graph 7 shows an improvement or stable result. For one patient in 2012/13 their average SATs was 88, this increased to 92 in 2013/14.

5.1.2. CHP Rushcliffe Community Matron

COPD, Co-morbidities and Anxiety

A potential barrier to using Flo with COPD patients is clinician concern it may actually increase anxiety. This has been reported for one or two patients and then Flo has been removed however for the majority it appears to reduce their concerns. The following case study has been written by Patricia (Trisha) Charnley a Community Matron in Rushcliffe area of Nottinghamshire and shows how Flo can support anxiety with family involvement. Trisha was successful in becoming a NHS England clinical advocate on the NHS exchange programme with the VHA as a result of this work.

The background to this patient’s story is important. He is an 85 year old man with COPD and heart failure. A secret smoker, who declined intervention and is housebound and lives alone in a rural location. His two daughters live approximately 30 miles away and one visits five days out of seven. A carer attends once a day to ensure the patient is up, dressed, has breakfast and takes medication. After working outside all his life the patient prefers a colder home and therefore has a tendency for low temperature readings and therefore Oxygen SATs readings would be very low if hands were not warmed up.

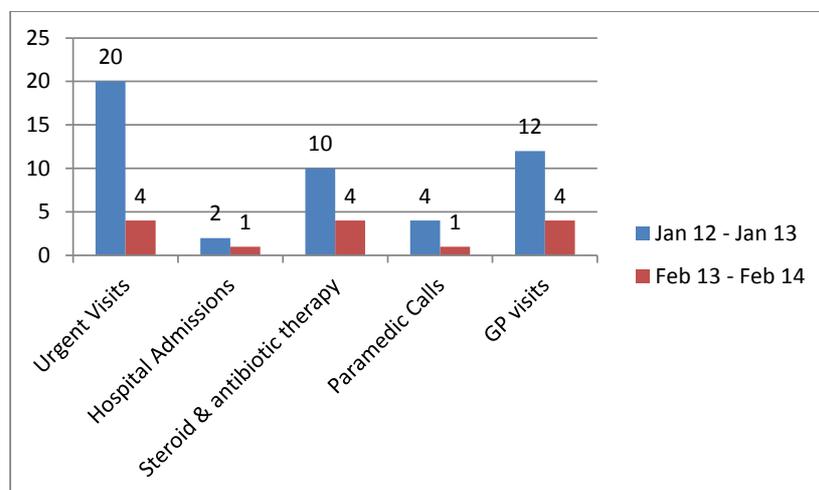
Table 4 - Summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|--|
| 1 | BP, pulse, weight and ox sats £162.41 per year | Significant reduction in crisis call out, GP call outs and patient/carer quality of life improved. |

Table 5 – Expected outcomes and key results

| Expected Outcomes | Findings |
|--|--|
| Reduce urgent visits | Crisis visits had been very frequent and lengthy – sometimes twice a month and up to 90 minutes alongside weekly routine visits. A lot of reassurance was needed. These have reduced significantly in Graph 8 from 20 in 2012/13 down to just 4 post Flo. |
| Reduction in admissions | Previously the following scenarios would result in an admission – Normally the patient especially after antibiotic/steroid therapy would result in low mood when stopped and the effects wear off. This resulted in increased anxiety, fear and breathlessness. Family would contact out of hours GP – which resulted in more antibiotics or an admission. Paramedics would attend and a low SATs reading (cold hands) and temperature with increased respirations would result in an admission. |
| More appropriate steroid and antibiotic therapy | With education and support the daughters can now tell when the patient needs medical attention. The patient liked having antibiotic therapy and steroid therapy as it made him feel very well but this resulted in very low mood and cycle of fear once stopped. |
| Reduce paramedic calls | The daughters now feel reassured and if their father is unwell they can text Flo with his observations. This has resulted in a reduction in call outs from 4 in 2012/13 to just 1 post Flo. |
| Reduce GP visits | This has reduced significantly from 12 pre Flo (in a 12 month period) to 4 post Flo (in a 12 month period). |
| Qualitative benefits identification of carer fatigue and empowerment in recovery | Improved quality of life for both the patient – who gains reassurance and less medical intervention. And his family who once they have checked his observations are confident they can support in the most appropriate way and have come off the almost weekly emotional rollercoaster of fearing that their father was about to die. The patient does have long term conditions and is nearing end of life, he does wish to stay at home and now is less likely to be taken to hospital due to crisis. |
| Reduced anxiety | Episodes of low mood and the patient stating he was going to die was a frequent occurrence. During these occasions they would seek medical support. The daughters now are reassured by having Flo that the readings are within normal range for the patient and that FLO will give advice if they are not. The Patient now believes his daughters when they say that his readings are in the normal range and will be reassured by them. |

Graph 8 – Clinical interventions 12 months pre and post Flo (n = 1)



There were no additional requirements or services used to support this patient such as respite and.

Qualitative feedback from the family has highlighted great reassurance: -

Florence - the other result . . . "I feel that Flo and the support of the Community matron has given me my life back. I love my dad but in the last few years the strain of constant call outs has been an emotional rollercoaster. Now with Flo as extra support, I can be confident in making the right decisions and am able to support and reassure Dad"

Daughter, 2014

This case study shows the importance of having the greater detail about the patient to truly see the effect of not only the appropriate use of NHS resource but also the quality improvement for patient and carer.

5.1.3. Bassetlaw Health Partnerships (BHP) Community Matrons

The BHP Community Matrons started using Flo in December 2013 therefore evaluation data at present is limited however the patient feedback data has been included in this report due to the success the team have had in a short space of time.

The data is representative of just 2 patients although the team had 17 patients enrolled by end March 2014 and are continuing to recruit.

Table 6 – COPD Summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|--|
| 2 | £244.67* | Improved patient self-management; clinicians reported reduction in contacts which were more appropriate. |

**Cost of protocol is high as this protocol also involves support messages, depression questions & message to rescue medication as appropriate. Equipment provided is blood pressure monitor, scales, thermometer and pulse ox meter.*

The team agreed to use the Advice Interactive Messaging (AIM) National COPD protocol with a few local adjustments to the messages and parameters. Each protocol is personalised for the individual patient and if comorbidities exist additional monitoring such as blood pressure or glucose readings are included. One blind patient is supported by his sister to use Flo and is finding it very reassuring for them both.

Table 7 – Expected outcomes and key results

| Expected Outcomes | Findings |
|--|---|
| Provide a productivity gain for COPD nurses, due to reduced number of visits and telephone calls | Graph 11 identifies a lot fewer contacts for the 2 patients. Further data and clinical system analysis will be required to fully evidence any reduction through quantitative analysis. |
| Access to an increase in monitoring information which provides more proactive and timely care management which should reduce exacerbations and therefore avoid hospital admissions | Again this will be evidenced with further data over a longer period. |
| Patient increased reassurance, self-care and awareness of SATs which may lead to decreased anxiety | The anecdotal feedback from patients has shown patients belief that Flo will support them. Graph 9 highlights the patient evaluation form feedback and identifies that both patients strongly agree that they feel reassured that Flo is helping them manage their condition. |
| To monitor COPD, so that medication can be titrated and reduce exacerbations | Further analysis of data available will be required. Anecdotally the nurses find the increased observations support their ability to titrate. |

Evaluation was only available for 2 patients, however both Patients strongly agreed with regard to all the statements in the Evaluation (see Appendix A)

“Florence is a great help not only to me, but to my husband who is my full time carer. We both feel confident and reassured using Florence. We both think this service is an excellent idea.

It allows not only me and my carer to keep a constant eye on my health, but it also gives my Community Matron extra time to use her time more efficiently on people who may need her attention more. But at the same time my Community Matron can also review the information I send daily to Florence at any time which is very reassuring, an excellent scheme which should be continued”.

BHP COPD Patient Age 55

The responses from clinicians have been extremely positive. The clinicians are encouraging the use of Flo and have created a caseload specifically for telehealth. The number of patients enrolled by the service since they started December 2013 (n =23) has been impressive as they have taken Flo and fully embraced it as a tool used in their service.

Ability to Self-Manage (n=2)

“Do you believe that using Florence has helped them to manage their own health & wellbeing better?”

For both patients, their clinicians stated that Flo is definitely supporting them to self-manage.

Number of contacts and appropriateness (n=2)

“Have you had more of fewer contacts with this patient since they started using Flo?”

“Have your contacts with this patient been more or less appropriate since they started using Flo?”

For both patients, the clinician indicated they there had been a lot fewer contacts and that they had been definitely more appropriate.

Further evaluation will be available and we anticipate further positive results.

5.1.4. Sherwood Forest Hospital Foundation Trust (SFHFT) Respiratory Team

The SFHFT Respiratory team first started using Flo in February 2013. Flo is used to support early discharge and patients are set up on the ward. The protocol monitors daily oxygen levels, blood pressure, temperature, pulse and asked a breathlessness, cough, sputum production and colour change. This was a complex protocol which was developed before the National AIM COPD protocol used in BHP and numerous GP practices was available.

Table 8 – COPD Acute Summary

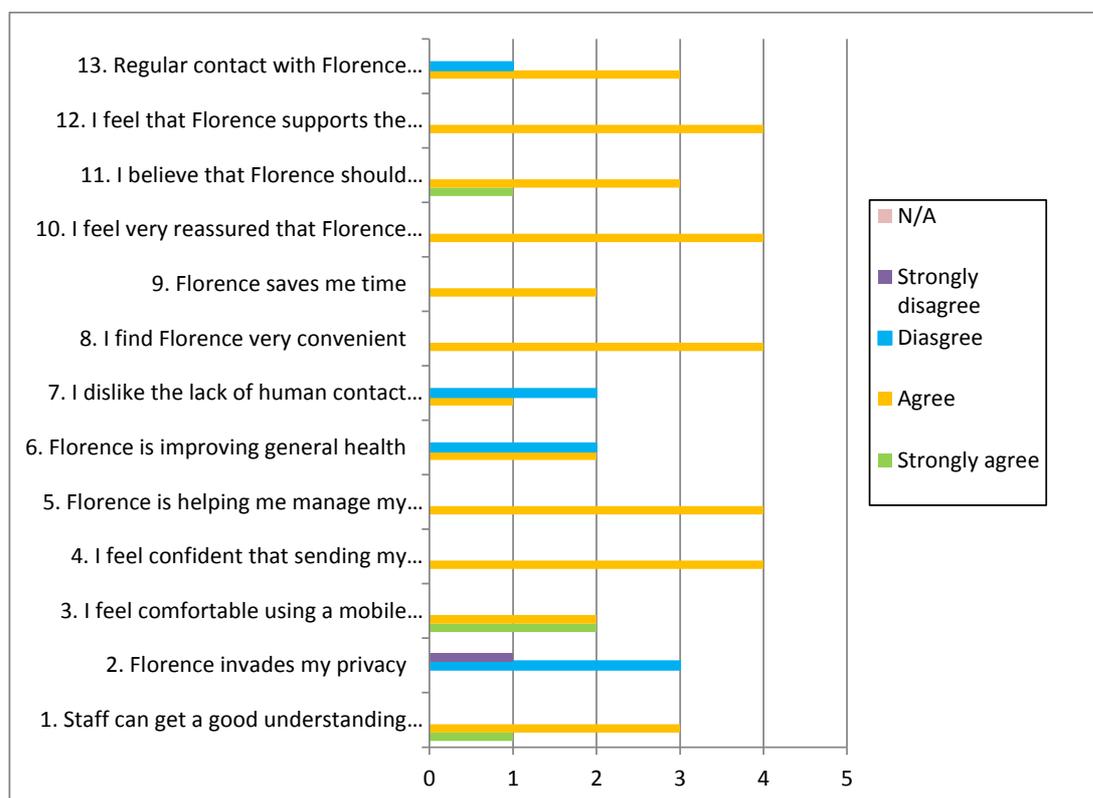
| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|--|
| 4 | £243.31 | Qualitative results show patients feel reassured and all feel it should become a standard service in the future. |

**Cost of protocol is high as this protocol also involves support messages, depression questions & message to rescue medication as appropriate. Equipment provided is blood pressure monitor, scales, thermometer and pulse ox meter.*

Expected outcomes and key resultsThe team have yet to have a review meeting. In the interim, no data apart from that collected via the patient/clinician questionnaires is available.

The age range of patients was 59 – 77. The following data was captured on the evaluation forms provided to the patients. Again all report that they feel very reassured that Flo is helping them manage their health better.

Graph 9 – Patient evaluation feedback (n=4)



Clinician feedback reported that they also believe Flo is helping the patients to manage their own help better. They have had a little more contact with the patient but these are reported as more appropriate contacts. Further data is required and a review with the team in order to work more closely with community teams and primary care colleagues to transfer patients.

5.1.5 General Practice - COPD

A national COPD protocol has been used by a number of practices. The data has been collated together due to small numbers and the early stage of evaluation as this was not used until December 2013.

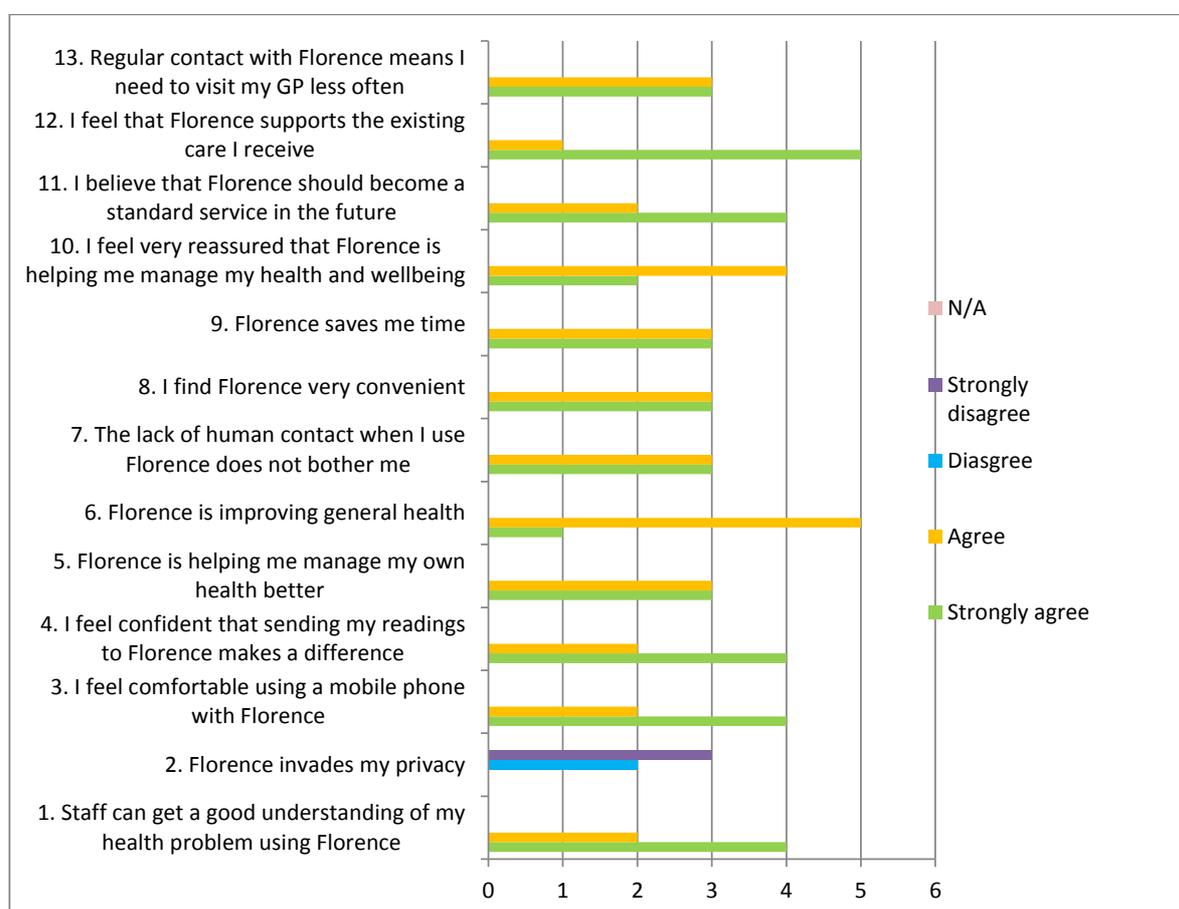
Table 9 – COPD Summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|--|
| 6 | £244.67 | 4 individuals are reported as managing their conditions better |

Table 10 – Expected outcomes and results

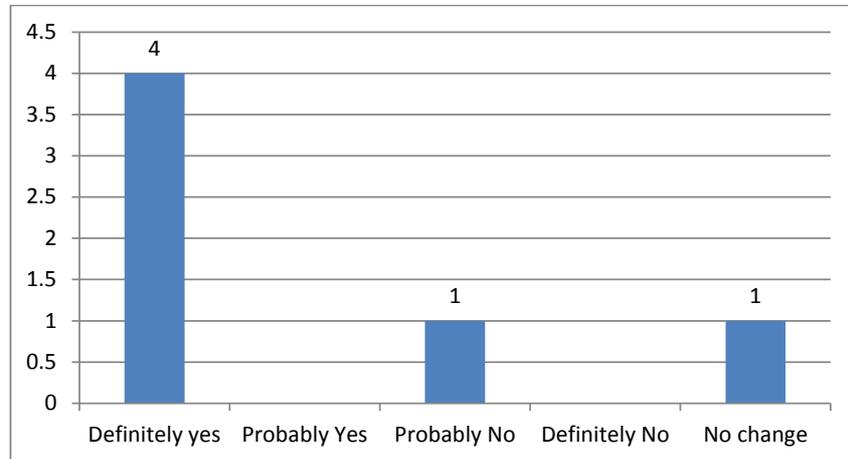
| Expected Outcomes | Findings |
|--|---|
| Fewer unnecessary admissions to hospital | There is anecdotal evidence of this within the patient and clinician feedback. Further data will be required over a longer period to validate this outcome. |
| Frequency and timing of rescue medication- initiated earlier when signs of deterioration | There is anecdotal evidence of this within patient and clinician feedback. Further data will be required over a longer period to validate this outcome. |
| Patient empowerment | Question 10 in Graph 10 highlights that patients feel reassured. |

Graph 10 – Patient evaluation feedback (n = 6)



Graph 11 – Ability to self manage (n = 6)

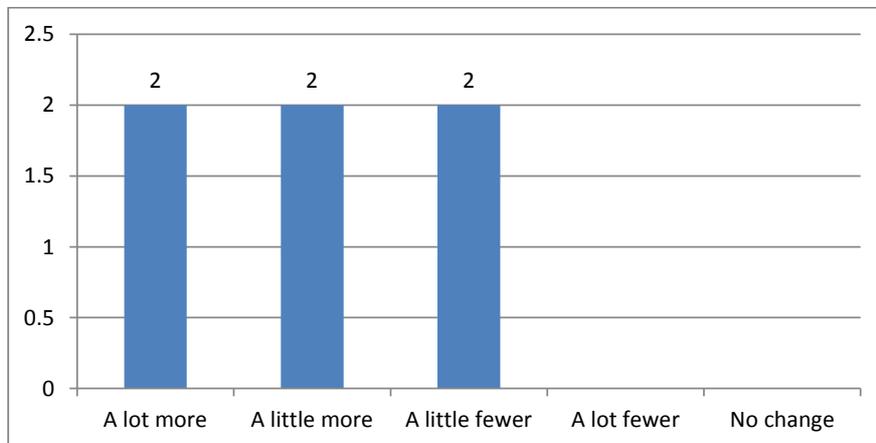
“Do you believe that using Flo has helped this patient manage their own health & wellbeing better ?”



The numbers are small, but indicate that Flo is helping them manage their condition better based on clinical observation.

Graph 12 – Number of Contacts (n = 6)

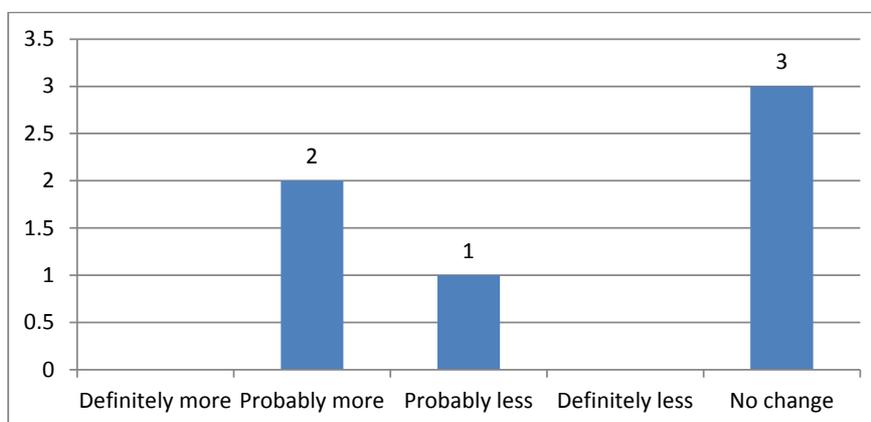
“Have you had more or fewer contacts with this patient since they started using Flo?”



The number of contacts has a more mixed result, but the following graph showing the appropriateness of contacts may be a better measure.

Graph 13 – Appropriateness of Contacts (n = 6)

“Have your contacts with this patient been more or less appropriate since they started using Flo?”



Clinician feedback has been positive and they continue to recruit patients. Patient reaction has been mixed. One patient did not do as Flo asked however the nurse saw the very low SATs readings and challenged the patient about them at a dressing visit and the patient opened up to discuss. Another patient likes to have frequent contact with the practice and has uses queries about the system as an excuse to contact the practice more often.

Surgeries where we have some data although limited have reported the following similar response:

One patient with COPD reported that he felt really supported by Flo in between practice visits, as it really reassured him as he had never been sure when to take his rescue medication before, but now Flo will tell him when it is needed.

(Roundwood Surgery GP, Mansfield and Ashfield CCG)

FIO & COPD – SO WHAT?

- Exacerbations occur with COPD and therefore patients with the same condition can have very different clinical need and outcomes.
- The protocols and costs differ greatly and therefore further analysis is required about the complexity of some protocols which are achieving similar outcomes to those which are less complex and cheaper.
- Discussion with individual teams about using the lower cost protocols will take place.

Key benefits to use are:

- Hospital admissions are averted
- Increases proactive care, therefore decreases incidence of exacerbations.
- Medication compliance is increased, reducing exacerbations
- Flo’s supportive self-management messages reassure patients.
- Staff have increased vital signs monitoring for their patients.
- Carer fatigue is identified early and avoided.

Section 5.2. Heart Failure

5.2.1 Primary Integrated Community Services Ltd (PICS)

The first service to use Flo in Nottinghamshire was NNE/NW Heart Failure team based at Church House surgery. Only one of the original members of staff is still in service and it has now become Primary Integrated Community Services Ltd (PICS Ltd).

They are an innovative team and have fully embraced the new approach such as extending the use of Flo to those that would benefit and being the first in the country to trial the Tell Flo App.

Table 11 – Heart Failure Summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|------------------------------|---|--|
| 34 (21 quantitative data) | £92.46 | A 35% reduction in visits and therefore increased capacity has been realised. Admissions have been avoided by detecting earlier signs of deterioration and anecdotal evidence exists. |

The cost of the protocol is per patient per year. Flo requests blood pressure, pulse and weight readings and can identify a weight increase set by the clinicians of 2 kgs in 4 days.

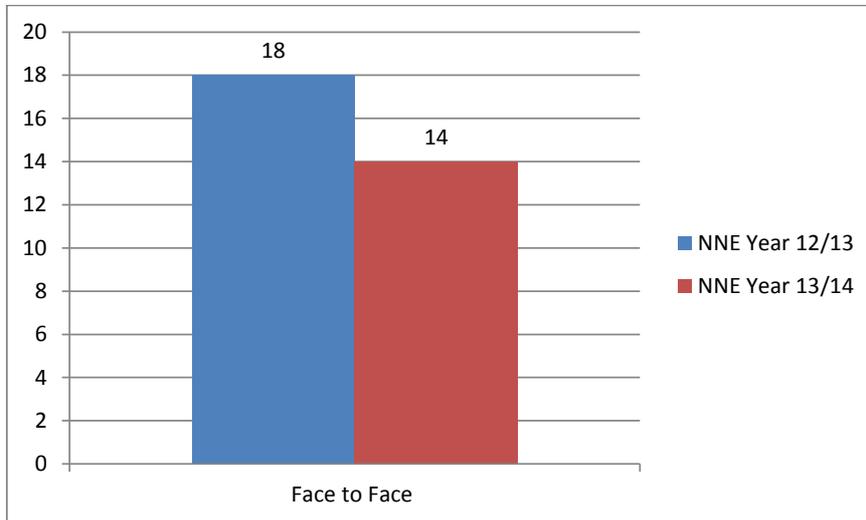
The data is representative of patient's age range 36 – 92 with average age 66 years old.

Table 12 – Expected outcomes and key results

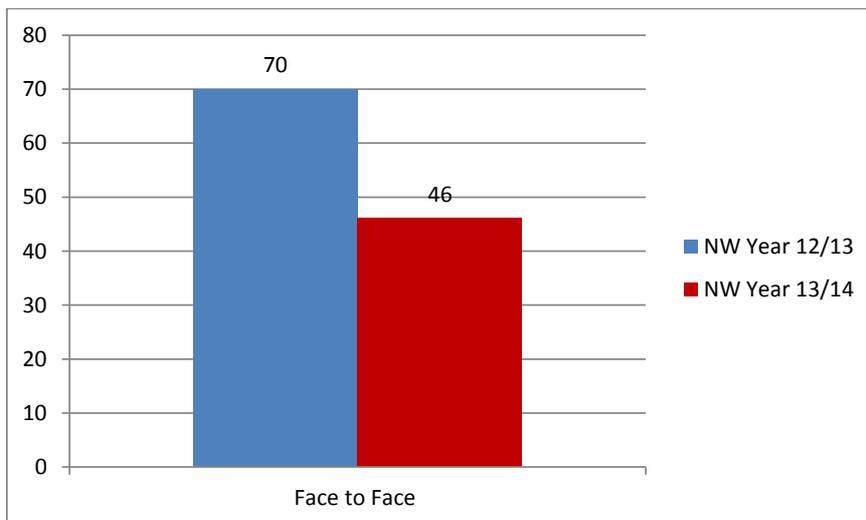
| Expected Outcomes | Findings |
|---|--|
| Provide a productivity gain for the HF nurses, due to reduced number of visits and telephone calls. | Graph 14 and 15 highlight the reduction in visits. There has been a 35% reduction in visits across the service for patients enrolled therefore creating capacity for the team. |
| Access to increase in monitoring information which provides more proactive and timely care management | Anecdotally there is qualitative evidence of this reported by the clinicians and the ability to titrate medication without visiting the patient. |
| Patient increased self-care and awareness of weight and blood pressure which may lead to healthier and stable readings | Graph 16 highlights weight readings for a selection of the patients data was available for and highlights stable recordings. |
| Rapid weight increase is generally due to fluid retention. Weight gain of more than 2 pounds is associated with admission to the hospital for heart failure. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2892745/ | Anecdotal evidence is available and a Quote from one of the Heart Failure Nurses: - <i>"FLO is working really working well - thanks. I have now had to increase one chaps weight readings to 3 times per week as his weight has gone up since last week, and he is clinically showing signs of deterioration, therefore I need to alter his meds accordingly. FLO means that I don't have to go in 3 times per week. I still visit once per week, and as he gets worse I will have to go in more, but for now it is really helping me gauge his condition</i> |
| To monitor hypotension, so that medication can be titrated and the risk of falls can be reduced | The clinicians are very positive about Flo and have even titrated a patient's medication without the need to visit. |

Graph 14 - Reduction in home visits (Nottingham North East NNE CCG area) (n= 4)

The team cover NNE CCG and NW CCG and as shown below there has been an overall reduction of 35%.



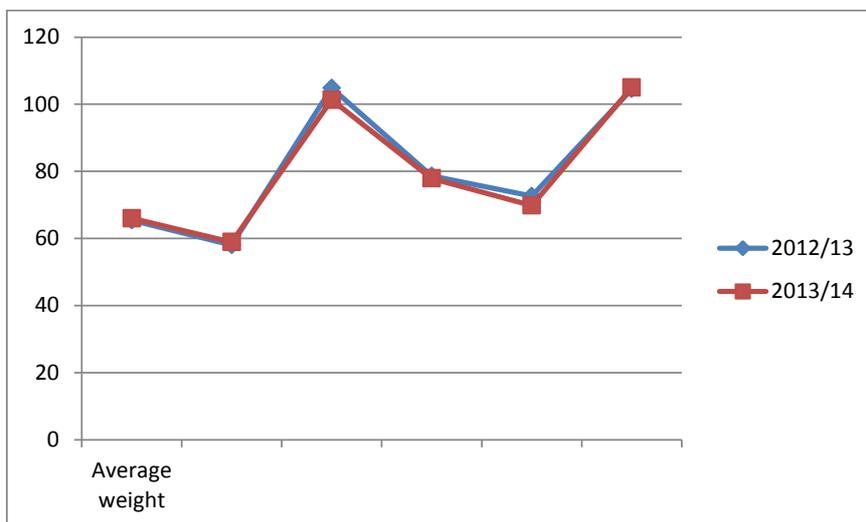
Graph 15 – Reduction in home visits (Nottingham West CCG area) (n=17)



Further data is required and will be evaluated with the team; however, anecdotally they feel this has reduced.

Graph 16 - Patient weight more stable reduced (n = 6)

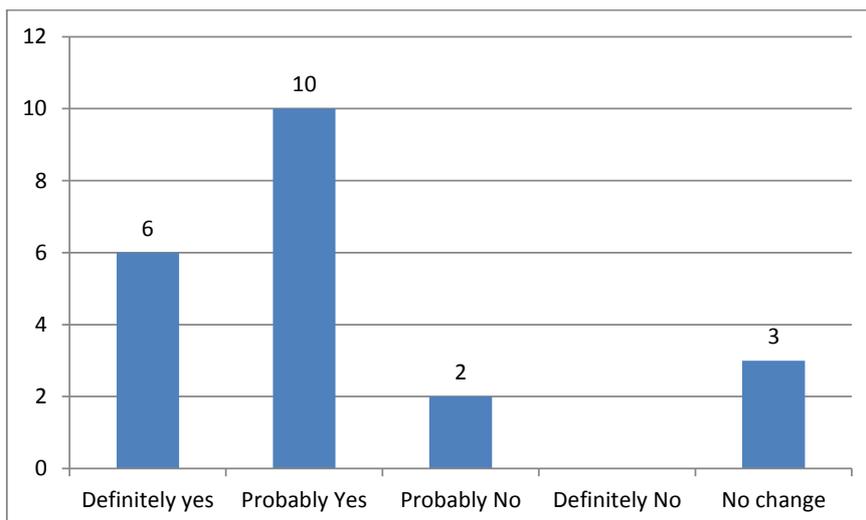
Further data is required; however for 6, randomly selected patients their weight was stable.



The patient/clinician evaluation has shown the following from the clinician’s point of view with an overwhelming majority Flo is supporting them to manage their health better as shown in Graph 17 below.

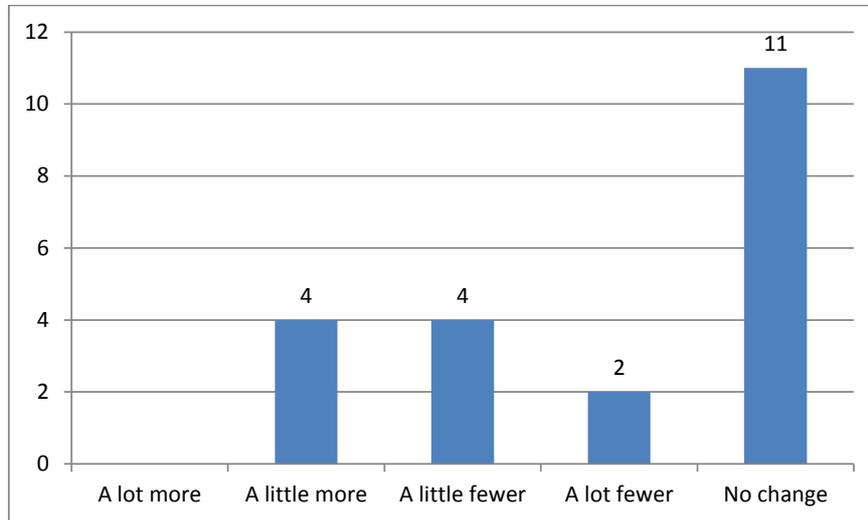
Graph 17 – Ability to Self-Manage (n = 21)

“Do you believe that using Flo has helped this patient manage their own health & wellbeing better ?”



Graph 18 – Number of contacts (n = 21)

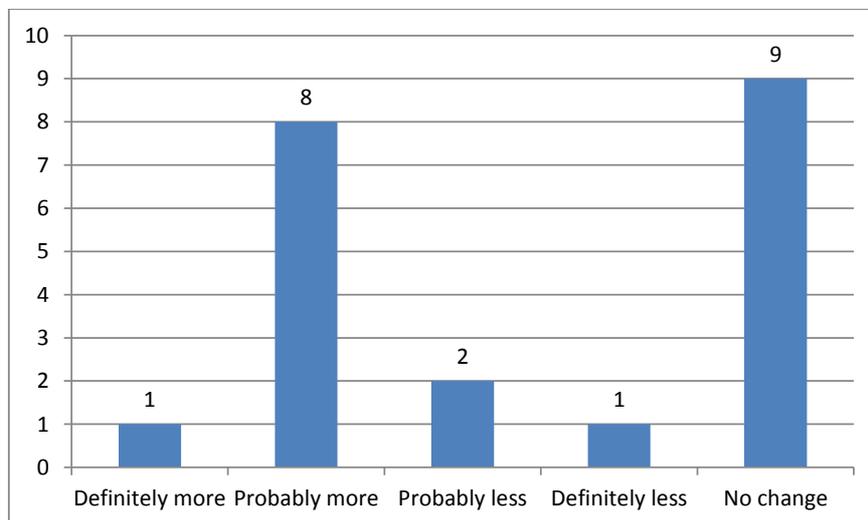
“Have had more or fewer contacts with this patient since they started using Flo?”



The results below are mixed and further individual patient condition information would support further understanding.

Graph 19- Appropriateness of Contacts (n = 21)

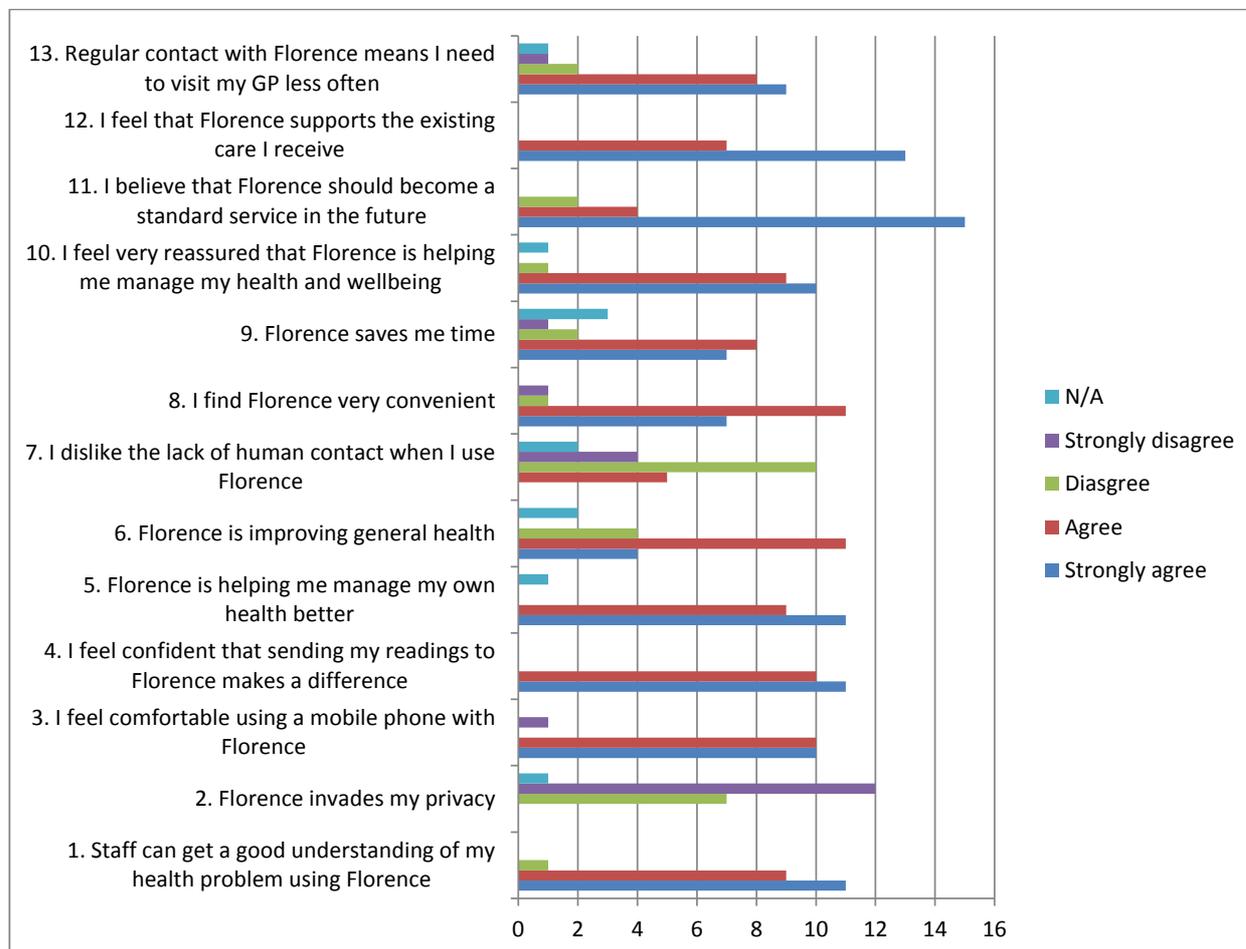
“Have your contacts with this patient been more or less appropriate since they started using Flo?”



Again mixed results, only 3 out of the 21 had less appropriate contacts reported.

The patient feedback was received for 21 patients out of the 34 as follows:

Graph 20 – Patient Evaluation Feedback (n=21)



Each Heart failure team identified the same outcome measures as above after reviewing this first deployment and have adopted the same protocol across other teams.

5.2.2. CHP Rushcliffe Heart Failure Team

Rushcliffe team has had staff changes throughout its use of Flo. The data is representative of 14 patient's age range 55 – 88 with average age 69 years old. Patients are monitoring Blood Pressure, Pulse and Weight with Flo picking up any increase in weight.

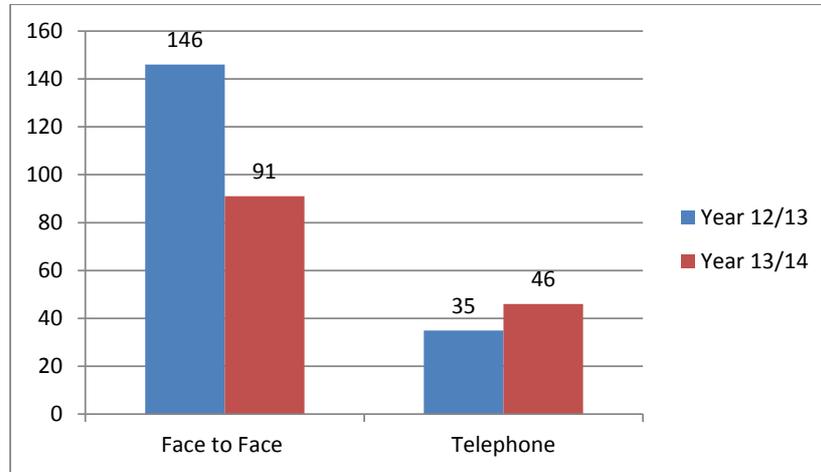
Table 13 – Heart Failure Summary

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|---|
| 14 | £92.46 | A 38% reduction in visits has been shown in the quantitative data. Overwhelming patient and clinician endorsement. |

Table 14 – Expected outcomes and key results

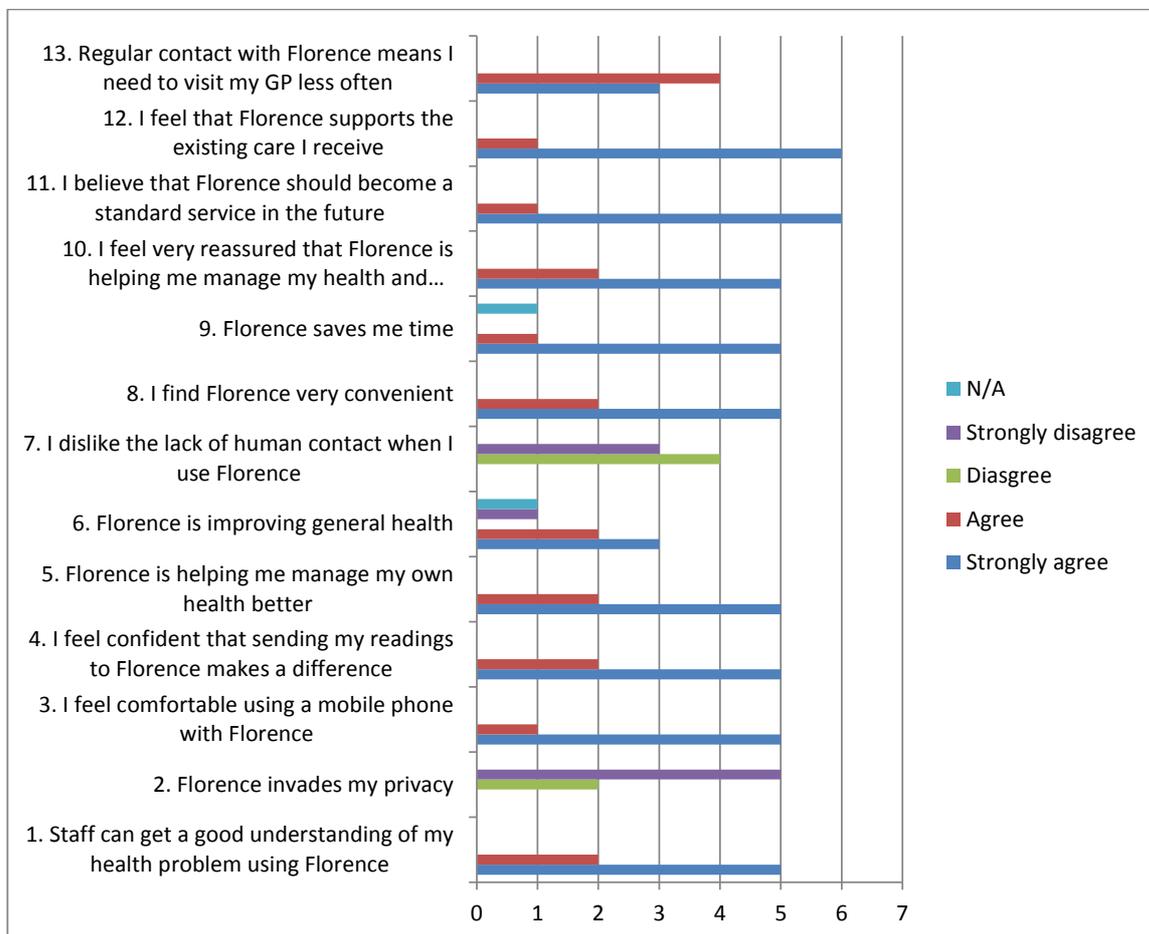
| Expected Outcomes | Findings |
|---|---|
| Provide a productivity gain for the HF nurses, due to reduced number of visits and telephone calls. | <ul style="list-style-type: none"> Graph 21 shows a 38% reduction in visits and therefore an increase in capacity. There is an increase in telephone contacts. |
| Access to increase in monitoring information which provides more proactive and timely care management | Qualitative feedback has highlighted how Flo has enabled proactive treatment. |
| Patient increased self-care and awareness of weight and blood pressure which may lead to healthier and stable readings | Graph 22 highlights the patient's responses, all patients agreed or strongly agreed that they felt reassured it was helping them manage their health and wellbeing. |
| Rapid weight increase is generally due to fluid retention. Weight gain of more than 2 pounds is associated with admission to the hospital for heart failure. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2892745/ | <ul style="list-style-type: none"> Anecdotal evidence is available from the clinicians and Flo alerts the patient to contact when weight has increased. Further admission data needs to be made available to analyse further. |
| To monitor hypotension, so that medication can be titrated and the risk of falls can be reduced | Again anecdotal evidence from clinicians using the increased monitoring data to support faster titration. |

Graph 21 - Reduction in home visits/telephone calls (n=14)



There has been a 38% reduction in visits and a 31% increase in telephone calls. Telephone call increases are reported as due to patients contacting the nurse and earlier signs of deterioration being picked up as shown in graph 26 the appropriateness of contacts is positive. More data is required on admission avoidance and further clinical indicators however the patient and clinician feedback is reported in the graphs below for 7 patients.

Graph 22 – Patient Evaluation Feedback (n =7)



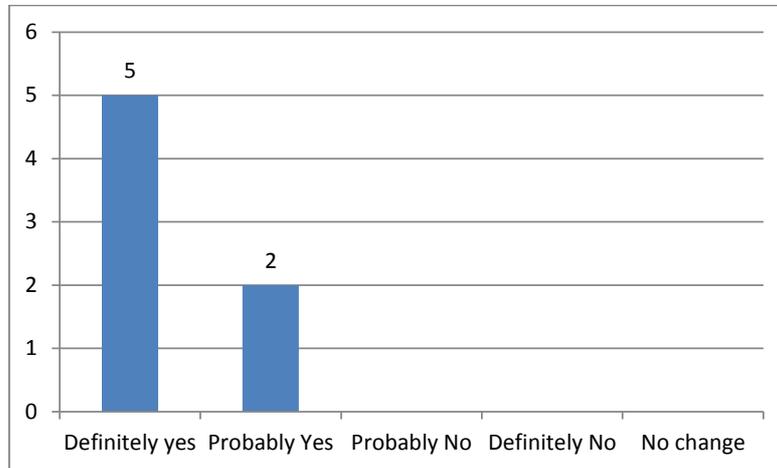
Clinician feedback: -

“Numbers are climbing on Flo! Me and my patients love it!”

Heart Failure Nurse

Graph 23 – Ability to self-manage (n= 7)

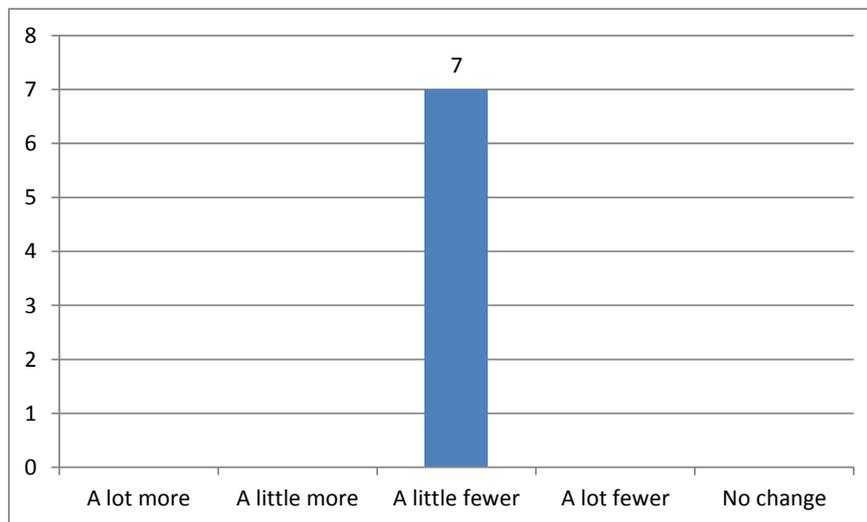
“Do you believe that using Flo has helped this patient manage their own health & wellbeing better ?”



Clinician feedback was only completed for 7 patients however the clinicians feel for those patients that Flo is supporting them to manage their health better.

Graph 24 – Number of Contacts (n =7)

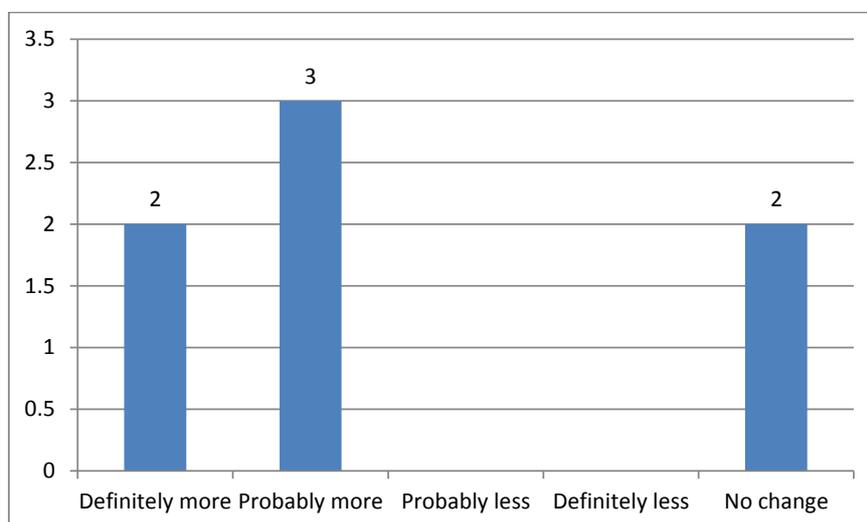
“Have had more or fewer contacts with this patient since they started using Flo?”



The Clinicians perception has been that there are a little fewer contacts but the graph shows; there has been a reduction

Graph 25 – Appropriateness of Contacts (n=7)

“Have your contacts with this patient been more or less appropriate since they started using Flo?”



For two patients there has been no change, however the other five are reported to have more appropriate contacts.

5.2.3. CHP - Other Teams:

Other individual teams such as PRISM virtual ward team have used Flo but only with limited numbers of patients therefore the following are individual cases where we have received feedback and enough data to present.

The Newark Heart Failure team only started at the end of 2013.

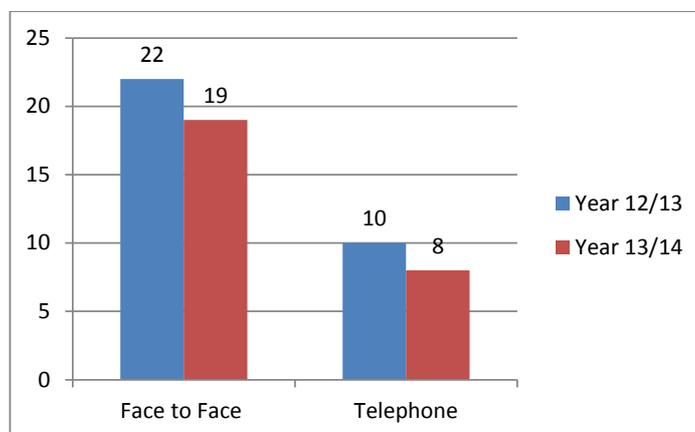
This patient aged 52 used to be a long distance lorry driver, with poor diet and very limited contact with their general practice. The patient had a heart attack while at work and was rushed into hospital in another area. Once discharged the community team have supported his rehabilitation and stabilisation and mental health as the patient no longer can work.

Flo has been used to continue to monitor this patient closely. The evaluation form returned had showed that the patient strongly agreed that Flo was helping them manage their own health better and the clinician reported a little fewer contacts but that contacts were probably more appropriate.

The Mansfield heart failure team identified patients and the following case study is that of a 82 year old male who has used Flo to support his self-management of his condition.

The following shows the slight reduction in contacts and telephone calls:

Graph 26 – Number of contacts (n=1)



Patient feedback identified that they felt that Flo was supporting them to manage their health better don't need to visit the GP so often. There was no change in the appropriateness of visits, but a slight reduction.

5.2.4. General Practice

Evaluation forms have only been returned so far for 2 patient's age 63 and 76 using Flo in general practice for heart failure monitoring. The patient responses were as follows:

Table 15 – Patient Evaluation Feedback (n=2)

| | Strongly agree | Agree | Disagree | Strongly disagree | N/A |
|--|----------------|-------|----------|-------------------|-----|
| Staff can get a good understanding of my health problem using Florence | | 2 | | | |
| Florence invades my privacy | | | 2 | | |
| I feel comfortable using a mobile phone with Florence | | 2 | | | |
| I feel confident that sending my readings to Florence makes a difference | | 2 | | | |
| Florence is helping me manage my own health better | | 2 | | | |
| Florence is improving general health | | 2 | | | |
| I dislike the lack of human contact when I use Florence | | 2 | | | |
| I find Florence very convenient | | 2 | | | |
| Florence saves me time | | 2 | | | |
| I feel very reassured that Florence is helping me manage my health and wellbeing | | 2 | | | |
| I believe that Florence should become a standard service in the future | 1 | 1 | | | |
| I feel that Florence supports the existing care I receive | | 2 | | | |
| Regular contact with Florence means I need to visit my GP less often | | 2 | | | |

The general practice nurse response:

Table 16 – Clinician Evaluation Feedback (n=2)

| | Definitely yes | Probably Yes | Probably No | Definitely No | No change |
|---|-----------------|---------------|----------------|-----------------|-----------|
| Do you believe that using Florence has helped them to manage their own health and wellbeing better? | 1 | 1 | | | |
| | A lot more | A little more | A little fewer | A lot fewer | No change |
| Have you had more or fewer contacts with this person since they started using Florence? | | | 1 | 1 | |
| | Definitely more | Probably more | Probably less | Definitely less | No change |
| Have your contacts with this person been more or less appropriate since they started using Flo? | | | | | 2 |

FIO & HEART FAILURE – SO WHAT?

- How Flo is used and for what purpose is key to its success in different teams. The raw data does not explain the disparities between how and what teams use it for, although there is a general trend towards increased capacity in the teams.
- In our interim report it was shown that visits increased, increased data has validated this.
- Different ways Flo is used, produces a variety of outcomes:
 - When Flo is used to **support self-management**, there is a reduction in nurse visits
 - When Flo used to **support titration and stabilisation of patients** there is a smaller reduction in nurse visits
 - When Flo is used to **detect early signs of deterioration**, contacts may increase.
 - One heart failure nurse has a patient who worked and was only available on a Friday afternoon. Titration of medication was done completely via Flo and no visits.
 -
- The flexibility of using Flo means that it has positive outcomes for patients across services which work in different ways.

Section 5.3 Hypertension

Hypertension is common and carries a great risk of morbidity. Many people may not realise they are hypertensive and it is often poorly managed and controlled.

The use of Flo in Hypertension has been evaluated and published¹⁶ and is part of a shared learning resource for general practice when identifying and monitoring hypertensive patients.

NICE guidelines¹⁷ recognise the use of Flo as good practice in blood pressure monitoring.

Locally a number of General Practices have used Flo to identify white coat and assist with diagnosis, to monitor and to titrate medication and stabilise patients quickly. The data has been collated across all protocols and practices, although the way Flo has been implemented can vary and the various models have developed:

- GP enrolls patient and sets up on Flo only
- GP refers to Nurse or HCA to set up
- Nurse or HCA initiates and sets up
- GPs refer to named resource within practice which could be non-clinical member of staff or pharmacist.

We will come back to the implications found of the above in the lessons learned section of this report.

Data was available for 29 patients Age range 45-75 with average age 59

Table 17 – Hypertension Summary

| Number of patients | Cost per patient per year*(inc equipment) | Summary of benefits |
|--------------------|---|--|
| 29 | £33.68 (Local Titration protocol) £52.40 (National AIM protocol) | Increased monitoring and anecdotal evidence from clinicians about being able to use this increased amount of data to Titrate more effectively and quickly. |

*figure is reduced pro rata for shorter usage

¹⁶ Cottrell E, Chambers R, O’Connell (2012) *Using simple telehealth in primary care to reduce blood pressure: a service evaluation. BMJ Open 2012;2:e001391.doi:10.1136/bmjopen-2012-001391*

¹⁷ www.nice.org.uk/usingguidance/sharedlearningimplementingniceguidance/examplesofimplementation/eximpresults.jsp?o=617

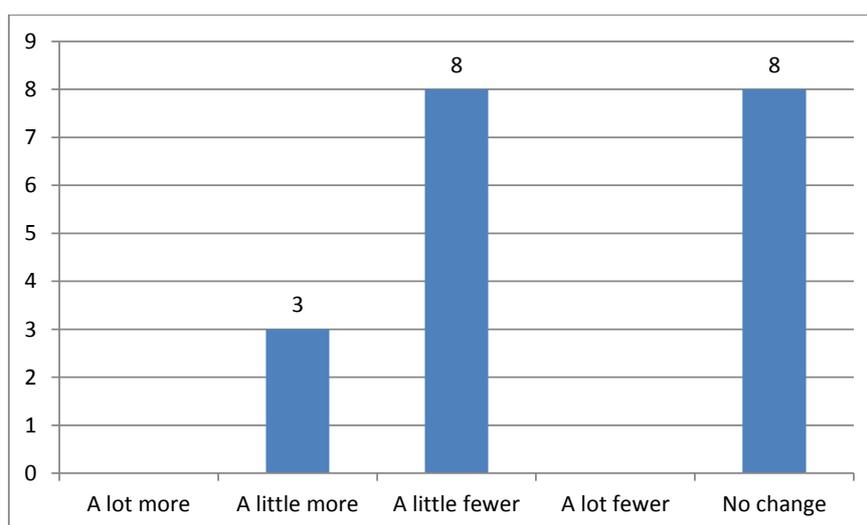
Table 18 – Expected outcomes and key results

| Expected Outcomes | Findings |
|---|---|
| To provide a productivity gain, due to: <ul style="list-style-type: none"> • Reduced Nurses appointment/telephone calls • Freeing up of recall appointments with GP's | Anecdotally this has been reported. In Graph 27 there are 8 patients where there has been a reduction in contacts. Graph 28 shows that for 9/19 patient's contacts are more appropriate. |
| Access to an increase in monitoring information which provides more proactive and timely care management, e.g. reduced over treatment with hypertensive medication | Increased monitoring information to support medication titration has been proven, speeding up the process. The development of a local protocol for titration has proved popular amongst general practice due to its flexibility to fit in with their processes for monitoring. |
| Reduced hospital attendance with falls, due to overtreatment and hypotension | Further data is required over a longer period. |
| Patient increased self-care and awareness of blood pressure which may lead to a healthier and more stable blood pressure | Patients evaluation form results show that 58% strongly agreed and 33% agreed that they felt reassured that Florence is helping manage their health and wellbeing. |

The data was analysed across each practice together and some forms had incomplete information or spaces where patients had left out questions therefore the number of patients with complete clinician response is 19.

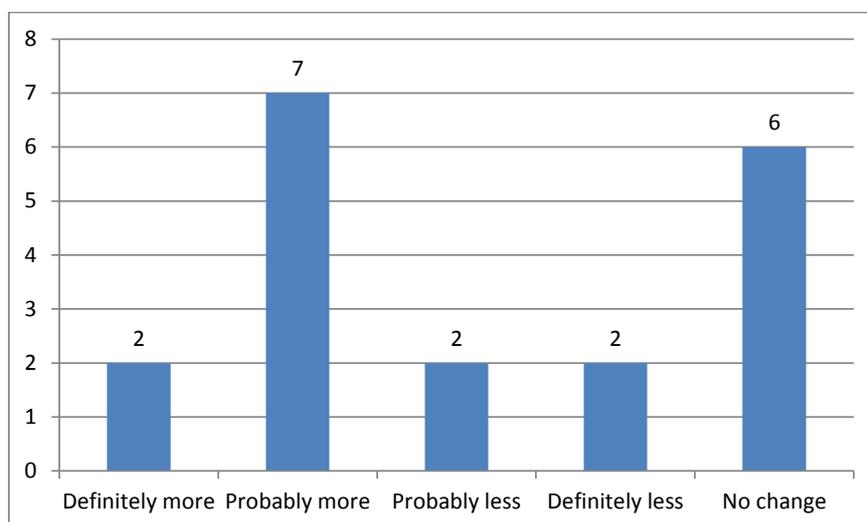
Graph 27 - Reduction in contacts (n= 19)

“Have you had more or fewer contacts with this person since they started using Florence?”



Graph 28 – Appropriateness of Contacts (n=19)

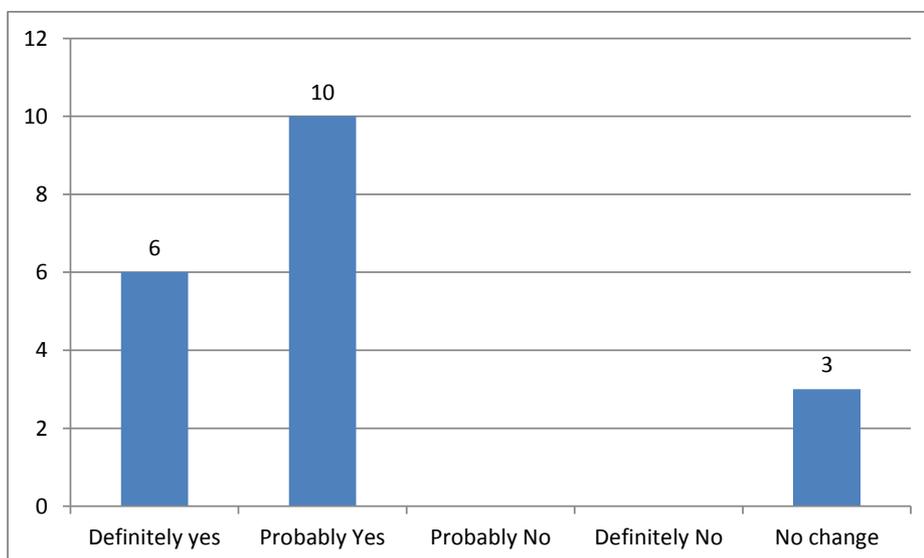
“Have your contacts with this person been more or less appropriate since they started using Flo?”



For 9 of the patients contacts are more appropriate.

Graph 30 – Ability to Self-Care (n=19)

“Do you believe that using Florence has helped them to manage their own health and wellbeing better?”



There is an indication that Flo has been very useful when used for prevention and for patients that cannot or will not attend the practice. Consideration should be given to expanding usage and extending use for carers who often neglect their own health due to difficulties in leaving relatives even for a short period of time.

One case study that shows this is as follows:

Fraser is self-employed and was identified as being hypertensive during his annual health check. He was very anxious about the amount of time he would need to have off work in order to attend GP appointments. Fraser and his Dr used Flo to monitor & titrate his medication, using Flo to get baseline readings pre anti-hypertensive medication being prescribed and then to collect blood pressure readings after Fraser began his medication.

Flo also asked Fraser to book a telephone consultation with his GP to review his BP readings. The GP reviewed the blood pressure readings on his Flo clinical dashboard prior to the telephone consultation with Fraser and assessed his medication. Flo will continue to request readings from Fraser until he is stable and then the frequency of requests will be reduced.

The titration of Fraser's medication has been much quicker due to availability of blood pressure data to his GP. He has had no time off work which has reduced his anxiety and he feels confident in managing his blood pressure depending on his readings, Flo will refer him to the self-management plan that Fraser and his GP have agreed.

Table 19 – Patient Evaluation feedback (n=29)

| | Strongly agree | Agree | Disagree | Strongly disagree | Not completed |
|--|----------------|-------|----------|-------------------|---------------|
| Staff can get a good understanding of my health problem using Florence | 41% | 48% | | | 13% |
| I feel confident that Florence protects my personal information/data | 10% | 80% | 10% | | |
| Florence is easy to use | 40% | 60% | | | |
| I feel comfortable using a mobile phone with Florence | 65% | 34% | | | 1% |
| I feel confident that sending my readings to Florence makes a difference | 51% | 49% | | | |
| I feel I have learned more about my condition and what works best for me | 10% | 50% | 30% | | 10% |
| Florence is helping me manage my own health better | 36% | 54% | 5% | | 5% |
| Florence is improving general health | 24% | 61% | 8% | | 7% |
| The lack of human contact when I use Florence does not bother me | 48% | 52% | | | |
| I find Florence very convenient | 48% | 48% | 4% | | |
| Florence saves me time | 50% | 50% | | | |
| I feel very reassured that Florence is helping me manage my health and wellbeing | 50% | 43% | 3% | | 4% |
| I feel that Florence supports the existing care I receive | 58% | 31% | 3% | | 8% |
| I have more meaningful communication with my doctor/nurse as a result of Florence monitoring my health | | 80% | | | 20% |
| Regular contact with Florence means I need to visit my GP less often | 46% | 46% | 8% | 2% | |
| I believe that Florence should become a standard service in the future | 61% | 39% | | | |
| I would recommend Florence to a friend or family member | 50% | 50% | | | |

Percentages are presented instead of numbers because several versions of questionnaire were used over the year, to improve data collection.

5.3.1 GP - a case study review:

A surgery in Ruddington first identified using Flo in practice to monitor patients with Hypertension back in November 2012. The practice identified a target cohort of patients who were due for a review. This report highlights the key findings so far identified and the positive feedback from patients.

All patients have been sending in monthly their Blood Pressure readings to Flo and the feedback has been very positive. Some key benefits were identified at the start of the project and the table below outlines our key findings so far.

Table 20 – Summary of benefits

| Benefits identified | Outcome |
|---|---|
| Increased frequency of blood pressure monitoring and accuracy of treatment decisions | This has been realised as all patients are regularly sending in the readings to Flo and they can be accessed by practice staff. |
| Reduction in number of visits needed to GP surgery, increasing convenience for patients and the need for face to face appointment slot for the practice (i.e. loss of 6 month review) | For some patients this is appropriate however others do still need to attend the have other tests such as Blood dependent on medication |
| Familiarisation of clinical and admin staff with the use of Flo with a view to more widespread use | This is a potential now as staff confidence has grown in using Flo |
| Reduction in practice nurse and GP clinic appointment time | This has been realised and reported by the HCA. Consultation time is quicker as the HCA is no longer required to take the patients' Blood pressure as they already have readings available. |
| Increased medication titration, therefore reduced medication costs | The readings are available to assess effectiveness of current medication regime/dosages |

Two areas identified for further evaluation are reviewing whether the patients' blood pressure is more stable, or reduced, and to review hospital admission due to hypotension pre and post Flo.

5.3.2. General Practice - Identification of white coat syndrome.

As highlighted earlier the process of who enrolls patients on Flo has a great impact on perceived effectiveness and time taken to implement Flo and its effectiveness within general practice. The following are two examples of where Flo has been used to monitor and identify white coat hypertension.

Table 21 – Summary of cost/ benefits

| Number of patients | Cost per patient per year(inc equipment) | Summary of benefits |
|-----------------------------------|--|---|
| Practice A (5) Practice B (10) | £25.84 (7 days of readings) | <ul style="list-style-type: none"> • Real time blood pressure measures without white coat effect • Appropriate treatment • Reassurance to patient. |

Practice A – GP only

The practice identified patients to trial Flo and were supported with these initial set ups.

GP feedback: -

"Following the initial session we had with yourself and your colleague present, we had no further patients signed up to use FLO. I feel this was because of the time involved in explaining to people how to use it; my colleagues were not keen to use it themselves. I have not received any formal feedback from the patients (ie. the evaluation forms), but some of them who I have since seen have told me what they thought. As we have mainly used it to diagnose white coat hypertension, requiring 7 day readings, most patients felt they would have found it easier to write their BP down and bring in a copy rather than have to text. If we were using it for longer term monitoring it may have come into its own more.

We had a few patients who never used it despite being signed up to it. The others did use it and found it easy enough but again it was only short term.

I found that I did not log into FLO unless a patient was with me who had used it. It was helpful in these cases.

Generally speaking I do not think we would use FLO enough at present for it to be useful to us as a practice, but I can see how it may be helpful in the future if patient's monitoring their own health became more widespread.

Practice B – whole practice approach and refer to nominated individual

All staff in the practice have access to Flo and all are aware and utilise in consultation. GPs refer patients to a designated individual for set up and analysis of the readings. They find it a lot quicker than patients presenting with a list of blood pressure readings that they then need to work out the averages which is a click of the button on Flo.

20 patients so far enrolled onto Flo although more are currently being recruited. It has specifically been used for identification of white coat hypertension and it has been reported as a really quick and efficient process.

Findings so far are that:

30% of patients were identified as white coat and they would have been put on medication.

25% were on long term medication but were identified as white coat and stopped increase in medication.

Patient feedback from **Practice B** has been as follows:

Table 22 – Patient Evaluation feedback (n= 10)

| | Strongly agree | Agree | Disagree | Strongly disagree | N/A |
|--|----------------|-------|----------|-------------------|-----|
| Staff can get a good understanding of my health problem using Florence | 50% | 50% | | | |
| I feel confident that Florence protects my personal information/data | | 100% | | | |
| Florence is easy to use | 100% | | | | |
| I feel comfortable using a mobile phone with Florence | 75% | 25% | | | |
| I feel confident that sending my readings to Florence makes a difference | 50% | 50% | | | |
| I feel I have learned more about my condition and what works best for me | 34% | 66% | | | |
| Florence is helping me manage my own health better | 50% | 50% | | | |
| Florence is improving general health | 25% | 75% | | | |
| The lack of human contact when I use Florence does not bother me | 50% | 50% | | | |
| I find Florence very convenient | 75% | 35% | | | |
| Florence saves me time | 75% | 35% | | | |
| I feel very reassured that Florence is helping me manage my health and wellbeing | 38% | 62% | | | |
| I feel that Florence supports the existing care I receive | 25% | 75% | | | |
| I have more meaningful communication with my doctor/nurse as a result of Florence monitoring my health | 34% | 66% | | | |
| Regular contact with Florence means I need to visit my GP less often | 38% | 50% | 12% | | |
| I believe that Florence should become a standard service in the future | 90% | 10% | | | |
| I would recommend Florence to a friend or family member | 100% | | | | |

Percentages are presented instead of numbers because several versions of questionnaire were used over the year, to improve data collection.

Key points within general practice besides the size of the practice and set up process are the benefits perceived in increasing amount of readings for QOF and to be seen as real efficiency gain if readings can be directly integrated into the patient’s clinical record.

5.3.3. Pre-operative use of AIM identification of white coat

The FLO Telehealth System is utilised in the Pre-Operative Assessment Unit to support care delivery and the following case study has been written by Carol Turner SODP and NHS ENGLAND TECS- Clinical Advocate.

Hypertension is the most common avoidable medical condition for postponing anaesthesia and surgery. However, ‘white coat syndrome’ is a phenomenon in which patients exhibit hypertension during a clinic visit and one which needs to be identified in order to reduce cancelled operations.

Table 23 – Summary of benefits

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|--|
| 14 | £3.15 | <ul style="list-style-type: none"> • Reduction in cancelled operations • Improved quality • Quicker treatment • More appropriate referrals to GP |

The patient is provided with an automatic blood pressure machine to take home and their twice daily blood pressure readings are texted in by the patient over a 7 day period. Patients are reminded by automated friendly text to submit their readings. The assessing nurse can then retrieve the readings in order to establish a plan of care, either to proceed with surgery or to refer for appropriate treatment.

The protocol follows NICE Guidelines (2011)¹⁸ – Clinical Management of Primary Hypertension in Adults; that in order to diagnose hypertension. a one off reading in a clinical setting should not be utilised due to patient anxiety and potential ‘white coat hypertension’.

¹⁸ <http://www.nice.org.uk/guidance/CG127>

Table 24 – Summary of key findings

| Expected Outcomes | Findings |
|---|---|
| Improvement / identification of pre-op risk factors i.e.; ischaemic and haemorrhagic stroke, myocardial infarction, heart failure, chronic kidney disease, cognitive decline + premature death. | over the 12month period, 42% patients were identified as white coat hypertensive |
| Patient self-care, ensuring more appropriate, speedier and accurate referrals to GPs | Previously all patients would have been referred to GP and operation potentially delayed therefore both acute and primary care benefit from this approach for using Flo. |
| Increased vital signs monitoring | Anecdotal reports of how this has improved patient safety and quality. The readings are used by the Anaesthetists before the operation. |
| Engaged staff members in innovation and telehealth | Staff enrol patients onto Flo and are given incentives such as Flo bracelets. |
| Increased clinical productivity Reduction on strain on NHS resources (reduced clinic time) | Graph 32 highlights that for the majority of patients' contacts were more appropriate. |
| Prevention of short notice cancellations | Graph 33 shows that for 10 patients cancelled operations was avoided |
| Increased surgical bed occupancy | Further data is required for this |
| Fully utilised theatre time | Through increased efficiency and the appropriate treatment or understanding of whether an operation needs to be cancelled can be evidenced. |
| Patient satisfaction | Table 25 shows the patients' views of using Flo after being informed their blood pressure was high. One individual commented on how reassuring it is for action to be taken so quickly. |

Evidence from the literature which supports this approach has been considered¹⁹ With the identification of hypertension, the incidence of pre-op risk factors such as ischaemic/haemorrhagic stroke, MI, heart failure, CKD, cognitive decline and premature death are significantly reduced.

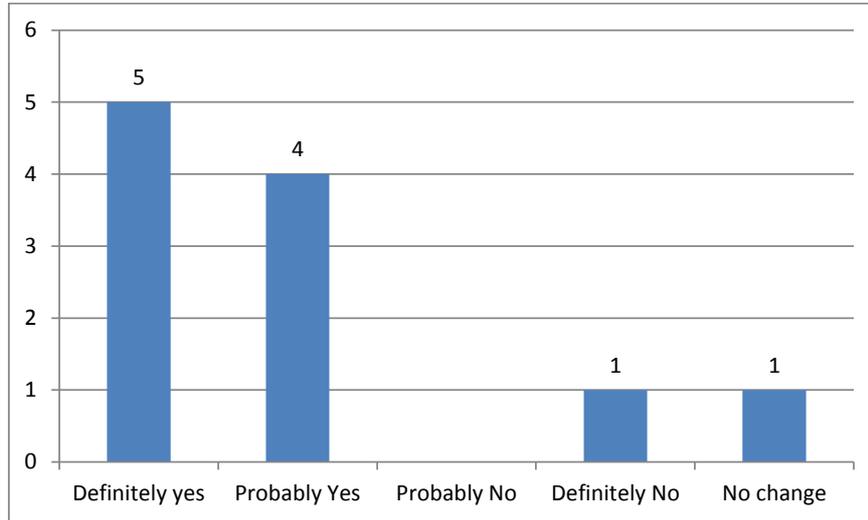
¹⁹ Dix, P. and Howell, S. (2001) "Survey of cancellation rate of hypertensive patients undergoing anaesthesia and elective surgery". British Journal of Anaesthesia. pp 789-793. 86 (6).

Foex, P. and Sear, J.W. (2004) "The Surgical Hypertensive Patient" Continuing Education In Anaesthesia, Critical care & Pain. pp139-143. 4(5).

Clinical responses were not completed in full.

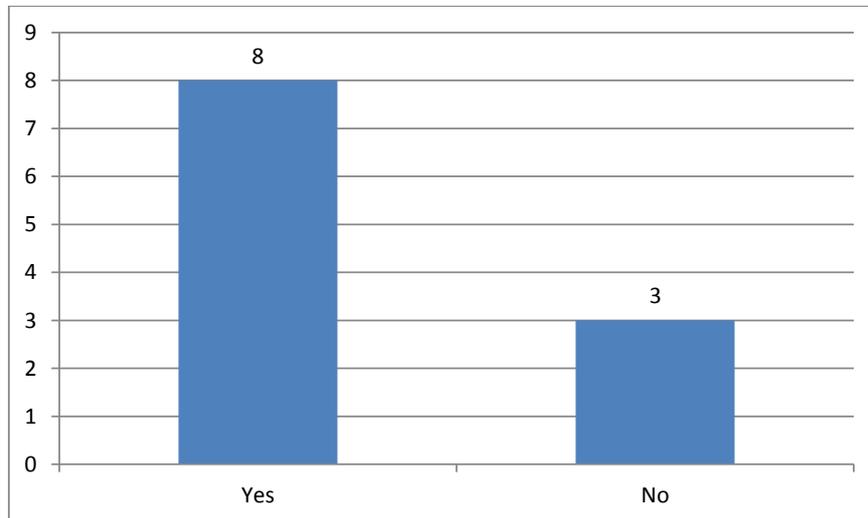
Graph 30 – Ability to self-manage (n=11)

“Do you believe that using Florence has helped them to manage their own health and wellbeing better?”



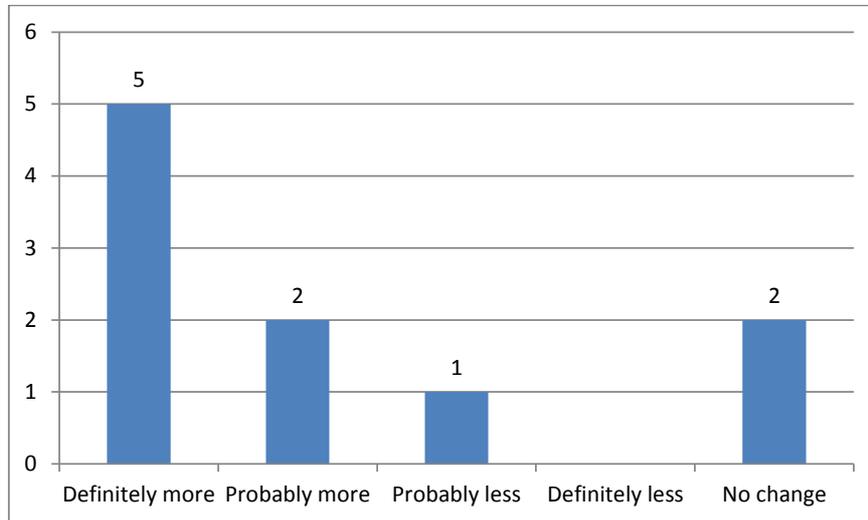
Graph 31 - Identification of Hypertension (n=11)

“Did Florence identify this patient as Hypertensive?”



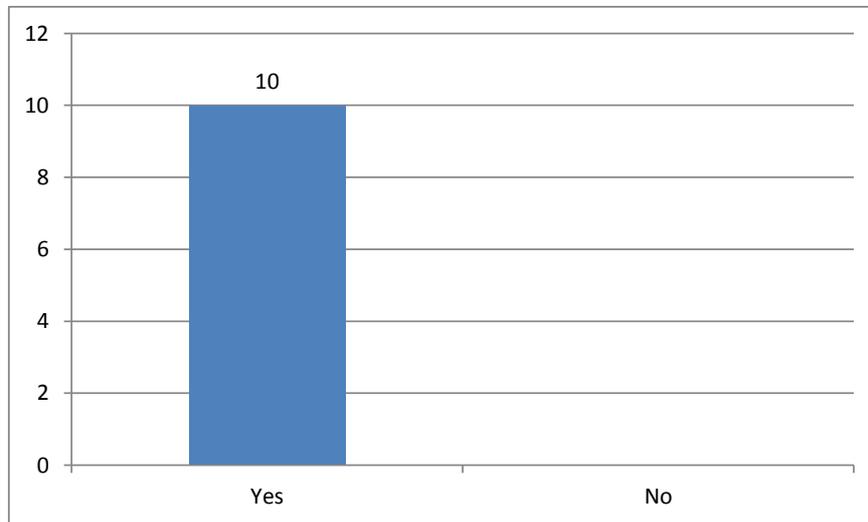
Graph 32 – Appropriateness of contacts (n = 10)

“Have your contacts with this person been more or less appropriate since they started using Flo?”



Graph 33 – Cancellation of Operations (n = 10)

“Did Florence support the Pre op team to reduce cancelled operations and provide safer care?”



Patient feedback has been overwhelmingly positive as patients report feeling that something is done straight away to support them, instead of previously having to try and get an appointment with their GP.

Table 25 – Patient Evaluation feedback (n=10)

| | Strongly agree | Agree | Disagree | Strongly disagree | N/A |
|---|----------------|-------|----------|-------------------|-----|
| Staff can get a good understanding of my health problem using Florence | 2 | 8 | | | |
| Florence invades my privacy | | | 4 | 5 | |
| I feel comfortable using a mobile phone with Florence | 2 | 7 | | | |
| I feel confident that sending my readings to Florence makes a difference | 2 | 8 | | | |
| Florence is helping me manage my own health better | 1 | 6 | 2 | | 1 |
| Florence makes me feel reassured | | 6 | 2 | | 1 |
| I dislike the lack of human contact when I use Florence | | 3 | 6 | | |
| I find Florence very convenient | 2 | 7 | | | |
| Florence saves me time | 2 | 7 | | | |
| I feel very reassured that Florence is helping me understand whether I have high Blood Pressure | 2 | 6 | 1 | | |
| I believe that Florence should become a standard service in the future | 2 | 7 | | | |
| I feel that Florence supports the existing care I receive | 2 | 7 | | | |

5.3.4. Blood pressure monitoring for diabetic patients

The National (Aim) Hypertension for patients with Diabetes protocol was introduced to a practice to support diabetic patients in order to improve patient compliance and to achieve increased monitoring of blood pressure and healthier lifestyle awareness.

Table 26 – Summary of Cost/Benefits

| Number of patients | Cost per patient per year(inc equipment) | Summary of benefits |
|--------------------|--|--|
| 7 | £52.40 | <ul style="list-style-type: none"> • Lifestyle changes and understanding of condition. • Less GP contact in surgery • More accurate blood pressure monitoring |

The following table highlights the key benefits the practice was hoping to achieve and the outcomes reviewed at 3 months post implementation

Table 27 – Review Meeting Outcomes

| Benefits identified | Outcome |
|--|--|
| Meet CCG targets | Achieved through using Flo monitoring hypertension amongst diabetic patients |
| Increase monitoring and appropriateness of treatment | The amount of monitoring information has increased and therefore has been used. On one occasion during a consultation a GP reviewed the readings and patient reported feeling happy that she had contributed to the consultation. It has confirmed appropriateness of treatment for all the patients. |
| Identify more accurately white coat hypertension | Two patients were identified. |
| Stabilise patients with hypertension | No evidence at present. |
| Support self-care management | Evidence of more awareness of condition and reassurance. |
| Reduction in clinic visits | Neutral. |
| More appropriate contacts | For two patients contacts were more appropriate for the rest there was no change. |
| Improved Blood pressure readings and compliance | No evidence but anecdotal reports from patients that compliance has improved and Flo has made them think about their lifestyle. |
| Other comments clinical view | <ul style="list-style-type: none"> • The mind-set of patients is key to whether they find Flo supportive or not. The group chosen were a very individualised and engaged group who attend practice whenever requested for QoF so are the better monitored already. • A lesson learned is to explain to patients that Flo isn't really going to have a huge impact on their readings without the advice. |
| Other comments patient view/case studies | <ul style="list-style-type: none"> • "Patient felt they "got into a state". Ended up doing BP3/4 times and using best figure. Wasn't confident about using the readings. Messages that came were Helpful" • "Although my BP is generally high, taking a reading daily makes me aware of the reading which helps regulate my day. Also I feel assured the medical team are registering the reading and advising me" • "Using Florence helps me to keep focused on my blood pressure and my general health. I try to make better lifestyle choices each day. However, despite these changes and taking all my medication, I am a bit disheartened when my blood pressure remains high. To be fair though, my blood pressure has not increased during the trial and that in itself is possibly a good outcome" • One patient sent in a detailed response. After discussing in practice this patient prefers attending the surgery and therefore this type of monitoring may not suit their needs. The final 2 points stated as below: |

Nottinghamshire Health & Social Care AT Workstream

| | |
|--|---|
| | <p>“I reacted to FLO’s suggestions and questions, although a few points were useful. But most of the questions could not be simply and definitively answered in mobile – phone- speak</p> <p>I feel that FLO might be fine-tuned and worthwhile. But for me, its present elements and demands lead to a pressurised system inappropriate for the needs of what purports to be a simple information gathering service”</p> |
|--|---|

The patient feedback forms give a mixed response which really reflects the comments received above to explain about the patients chosen and their expectations.

Table 28 – Patient Evaluation feedback (n=7)

| | Strongly agree | Agree | Disagree | Strongly disagree | N/A |
|--|----------------|-------|----------|-------------------|-----|
| Staff can get a good understanding of my health problem using Florence | 1 | 6 | | | |
| Florence invades my privacy | 1 | 1 | 1 | 4 | |
| I feel comfortable using a mobile phone with Florence | 4 | 3 | | | |
| I feel confident that sending my readings to Florence makes a difference | 1 | 3 | 3 | | |
| Florence is helping me manage my own health better | 1 | 4 | 2 | | |
| Florence is improving general health | 1 | 3 | 2 | 1 | |
| The lack of human contact when I use Florence does not bother me | 3 | 3 | 1 | | |
| I find Florence very convenient | 3 | 4 | | | |
| Florence saves me time | 3 | 1 | 1 | 1 | 1 |
| I feel very reassured that Florence is helping me manage my health and wellbeing | 1 | 4 | 1 | | |
| I believe that Florence should become a standard service in the future | 3 | 2 | 2 | | |
| I feel that Florence supports the existing care I receive | 2 | 3 | 2 | | |
| Regular contact with Florence means I need to visit my GP less often | 2 | 3 | 2 | | |

Additional feedback was received from a patient and their comments highlight the need for better education of clinician and patient in sharing and understanding their condition through a shared management plan.

“Overall a very positive experience and one that I would like to carry on using. It is disappointing that it is only a trial, as I would like to be able to monitor on an on-going basis. The only slight negative/constructive feedback I would give is that there was no personal feedback from GP/Nurse”.

Diabetic with high blood pressure age 44

The evaluation forms and discussions have enabled the practice to review all patient and clinician views, and based on this are continuing to use Flo.

FIO & BLOOD PRESSURE MONITORING – SO WHAT?

- There are a variety of different models of using Flo within Primary care to suit different ways of working.
- There is anecdotal evidence that Flo speeds up titration of medication and stabilisation, but this is difficult to measure, as there is no way of base lining this.
- Identification of white coat hypertension in the preoperative phase, improves the use of acute care resources, reduces cancelled operations and increases the appropriateness of referral to General Practice.
- There is evidence of patients becoming more aware of their condition and taking proactive steps to improve their health.

Section 5.4 Diabetes

Flo has supported patients with diabetes in other parts of the NHS and some clinicians utilise Skype (Video consultations) alongside Flo²⁰.

There is evidence that decision support through text based systems can support patients to control their diabetes²¹.

Diabetes is a target area that needs more attention across Nottinghamshire especially given the impact it has had in the following case studies.

Table 29 – Summary of benefits

| Number of patients | Cost per patient per year(inc equipment) | Summary of benefits |
|--------------------|--|--|
| 1 | £350.40 | <ul style="list-style-type: none"> Reduction in admissions from 46 in 12 months to 2 in 9 month period. One hospital admission costs £2,000. Improved quality of life and ability to self-manage |

The first case study is that of a 22 year old male with brittle Diabetes. On first meeting Josh he reported that he was very depressed and was not testing his blood sugars and was therefore guessing how much insulin he needed. Josh agreed to try using Flo to receive reminders about sending in his blood glucose readings and this is his story.

“My Diabetes Nurse suggested I consider a new approach to monitoring my blood glucose levels. I agreed and she signed me up in 5 minutes with ‘Flo’. Flo has changed my life, she texts me between 5-7 times every day for my readings and she sends a message back that guides me and relates to my self-management plan.

I would say that Flo has saved my life, I am no longer going in and out of hospital and when I do see my doctor and nurse I can have a more meaningful discussion about my health. I would recommend Flo to everyone”.

(Diabetic patient aged 22)¹

Table 30 - Expected outcomes and key results

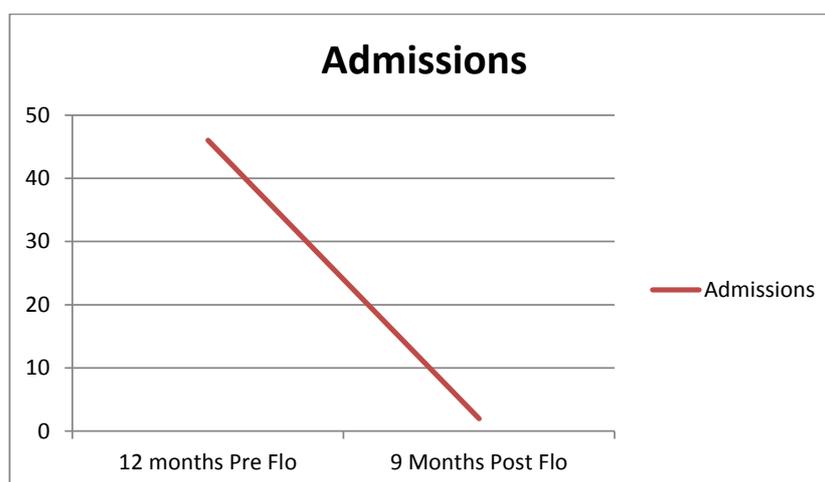
²⁰ <http://vimeo.com/65422393>

²¹ Waruna Gunathilake, M.D. Sajith Gunawardena, Ranga Fernando, George Thomson, MbCh, Devaka Fernando, M.D., FRCP (2013) *The Impact of a Decision Support Tool Linked to an Electronic Medical Record on Glycemic Control in People with Type 2 Diabetes*. Journal of Diabetes, Science and Technology 05/2013; Volume(3):653-659.

| Expected Outcomes | Findings |
|---|--|
| Increased frequency of blood glucose monitoring and accuracy of treatment decisions | Josh now sends his readings to Flo up to 7 times a day and went from not testing his sugar levels and guessing his insulin to now tested every day when he needs to according to his care plan. This increased amount of monitoring supports the General Practice Nurse. |
| Increased compliance by patient | Josh is now managing his diabetes and controlling his levels as best he can. He is engaged with the practice and is also a Flo advocate and speaks at events such as AGMs and is keen to share his story. |
| Decreasing A&E admissions | Josh was averaging an admission every 9 days so in a 12 month period before Flo he had 46 admissions. In the 9 months since using Flo he has had 2 admissions as shown in graph 34. |
| Familiarisation of clinical and admin staff with the use of Flo with a view to more widespread use. | The practice now utilise Flo for other patients and other conditions such as weight loss. |
| Patient's blood glucose is more stable/reduced | Graph 35 highlights the average readings and breaches Josh had when he first started using Flo his readings have stabilised with more control. |

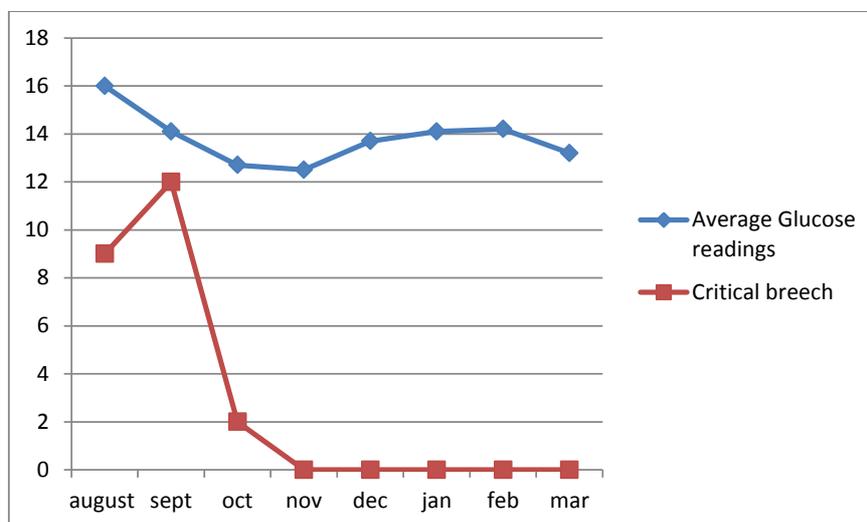
The following graph shows the drop in admissions 12 months. Prior to Flo there had been 46 admissions and in the last 9 months, just 2 admissions.

Graph 34 – Admissions Pre and Post Flo (n = 1)



Brittle diabetes is very difficult to control and fluctuations in readings can be great. The following shows the average glucose readings for Josh since using Flo. It also highlights the number of critical breach alerts triggered by either very high readings or low.

Graph 35 Average Monthly Glucose readings (n=1)



Josh has been using Flo for over 8 months now and is regularly sending in his readings. The data is being used as part of his MDT review meeting. His readings are by no means stable but he is feeling more motivated and less depressed and has had only two hospital admissions since using Flo (prior to Flo he averaged 1 admission every 9 days).

It is accepted that this case study is at one end of the spectrum, but is an example of what can be achieved by “thinking differently” and supporting patients to take responsibility for aspects of their own care.

The second case study is that of Sid:

Community Nurses had been struggling to get Sid to comply with his diabetic care. Sid stopped recording his glucose levels and was taking his insulin in an ad-hoc manner. He was also struggling with depression and looking after his alcoholic wife. They have a young family, and a neighbour had recently reported them to Social Services, stating they felt the child was being neglected.

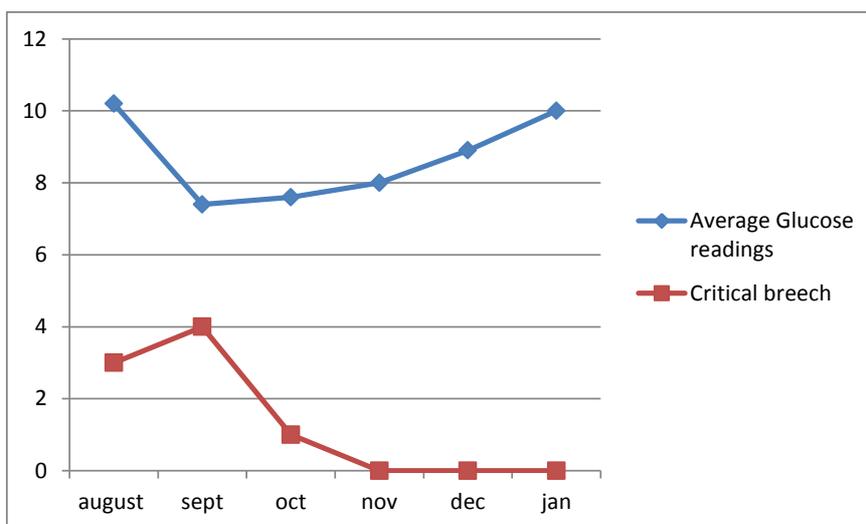
Since this event Sid became disengaged and lost motivation to manage his diabetes. When the nurse visited she was unable to titrate his insulin as there was no record about Sid’s glucose levels.

The nurse explained Flo to Sid and he was keen to try it and get his diabetes better controlled, particularly as he also expressed concerns that he was losing feeling in both his feet and had a recent fall.

Flo has been texting Sid 3 times a day to remind him to test and submit his glucose readings and to take his insulin accordingly every day for the past three weeks. The nurses now have access to his readings and can effectively titrate and support his insulin requirements. Sid’s readings are not yet stable and he has breached his parameters on a few occasions, however now the staff can support him to manage and control his diabetes more effectively. The cost of using Flo with Sid is 72p per day.

Sid had no admissions in the 12 months pre and post Flo as he did not seek assistance when he was ill. The following shows the average glucose readings for Sid since using Flo. It also highlights the number of critical breach alerts triggered by either very high readings or low and shows that with the support of the community nurse and Flo his insulin has been titrated and reduced his critical breaches to zero and supporting him to manage his condition.

Graph 36 Average Monthly Glucose readings (n=1)



The patient feedback forms received from the two general practices using Flo for diabetes have reported the following: -

Table 31 – Patient Evaluation Feedback (n = 2)

| | Strongly agree | Agree | Disagree | Strongly disagree | N/A |
|--|----------------|-------|----------|-------------------|-----|
| Staff can get a good understanding of my health problem using Florence | 2 | | | | |
| Florence invades my privacy | | | 2 | | |
| I feel comfortable using a mobile phone with Florence | 2 | | | | |
| I feel confident that sending my readings to Florence makes a difference | 2 | | | | |
| Florence is helping me manage my own health better | 2 | | | | |
| Florence is improving general health | 1 | 1 | | | |
| I dislike the lack of human contact when I use Florence | | | 2 | | |
| I find Florence very convenient | 1 | 1 | | | |
| Florence saves me time | 1 | 1 | | | |
| I feel very reassured that Florence is helping me manage my health and wellbeing | 1 | 1 | | | |
| I believe that Florence should become a standard service in the future | 2 | | | | |
| I feel that Florence supports the existing care I receive | 2 | | | | |
| Regular contact with Florence means I need to visit my GP less often | 1 | 1 | | | |

Both clinicians reported more appropriate contacts and believe Flo is helping the patient's manage their own health and wellbeing better.

FIO & DIABETES – SO WHAT?

- Another organisation²² using Flo with diabetic patients have : -
 - Increased medication compliance
 - Significant clinical time savings
 - Improved HBA1c readings
 - Reduced hospital admission by 58%
- Further cohorts of patients are needed to fully evaluate improvement in compliance, however the significant impact Flo has had on one patient shows it's potential for supporting patients with diabetes.
- There are significant numbers of diabetic patients who could benefit from Flo which has been evidenced through the significant interest from local Diabetes UK group members.
- The use of Flo has a positive impact on patient compliance.
- The use of Flo with diabetic patients could have a significantly positive impact in reducing community nurse visits.

²² Rajput, Vije (2012) *Taking charge of Diabetes. Using Florence to reduce clinical time and reduce hospital admissions*
South East Stafford Community Diabetes Team

- The use of Flo with diabetic patients is very cost effective, given that the patients already have the required biometric equipment.

Section 5.5 Asthma

There is limited use of Flo locally within the management of asthma patients and only one patient currently uses as a reminder to give their child their inhaler. One practice that have been using to monitor peak flow as a trial have had the following responses which are useful to include, although further use will be required to understand the impact Flo may have especially on brittle asthmatics and targeting high unnecessary admissions. The patient responses were as follows:

Table 32 – Patient Evaluation feedback (n=3)

| | Strongly agree | Agree | Disagree | Strongly disagree | Not applicable |
|--|----------------|-------|----------|-------------------|----------------|
| Staff can get a good understanding of my health problem using Florence | 2 | | 1 | | |
| Florence invades my privacy | | | 1 | 2 | |
| I feel comfortable using a mobile phone with Florence | 2 | | 1* | | |
| I feel confident that sending my readings to Florence makes a difference | 1 | 1 | | 1 | |
| Florence is helping me manage my own health better | 1 | | 2 | | |
| Florence is improving general health | 1 | | 2 | | |
| The lack of human contact when I use Florence does not bother me | 1 | 2 | | | |
| I find Florence very convenient | 1 | 1 | 1 | | |
| 9. Florence saves me time | 1 | | 1 | 1 | |
| I feel very reassured that Florence is helping me manage my health and wellbeing | 1 | | 1 | 1 | |
| I believe that Florence should become a standard service in the future | 2 | 1 | | | |
| I feel that Florence supports the existing care I receive | 2 | | | 1 | |
| Regular contact with Florence means I need to visit my GP less often | 1 | 1 | 1 | | |

*the disagree response from a patient was expanded on to explain why this was:

"I have a low peak flow (around 170) my level has been reset saying that this is normal for me with the GP. Frustratingly however this has not been adjusted"

The practice did adjust the parameters for the patient and this was part of their learning in understanding what is normal and ok for an individual and highlights the flexibility Flo can offer to suit individual needs. As

this is just peak flow monitoring further advice and support around medication and managing their condition may also be useful to support self-care.

FIO & ASTHMA – SO WHAT?

- A confidential enquiry report by the Royal College of Physicians into the public health impact of asthma stated that deaths in the UK caused by asthma are reported to be among the highest in Europe²³. Flo could be used further to support patients to manage their asthma more effectively.
- In previous findings with the National AIM protocols for inhaler reminders, it was found that 50% of participants felt more confident in managing their breathing control and supported them to take their inhaler regularly as prescribed.
- Stepping up and stepping down medication, especially stepping down has proven effective in managing patient’s asthma control. However patient education and understanding triggers is key, along with monitoring peak flow. Flo could be used to educate patients and support step up/down control and reduce the side effects of long term steroid use.

Section 5.6 Aspergers

Service users across Nottinghamshire, with an Asperger’s diagnosis, have been utilising Flo, in a social care context since July 2013.

Table 33 – Summary of benefits

| Number of patients | Cost per patient per year (inc equipment) | Summary of benefits |
|--------------------|---|---|
| 7 | £87.60 | <ul style="list-style-type: none"> • Improved quality of life • Supports independence • Family/carer fatigue avoidance and support • Overall cash avoidance for all of the service users was £6,808 in domiciliary care package provision • Reduced service users care packages by a combined 34.5 hours per week. |

The team also use Flo with a cohort of clients who forget to eat, have a low BMI, but are trying to remain independent. Using Flo is the reducing risk of carer breakdown within the families and also reducing the risk of admission to residential care. Flo asks clients if they have eaten a daily main meal. If they respond positively, they receive a positive message. If not, Flo texts them to encourage them to do so. If they answer negatively more than once over a given time, Flo will text their key support worker/carer so that they can intervene as necessary. For one individual with the lowest BMI, since using Flo they have now put on 1 stone in weight and have requested additional prompts to help them remain independent in other aspects of their life.

Additional usage was suggested by the service users around other activities of daily living. It has given quality and independence to both service user and carer and can be highlighted in the case study below.

²³ <http://www.nhsinform.co.uk/behind-the-headlines/heart-lungs/2014/05/asthma-is-still-a-killer-report-warns>

One resident was going downstairs up to 12 times a night to check that the doors were secure and has been receiving a text prompt every night which asks him to confirm if he has locked the doors.

The texts allow him to see if that he has completed this task by checking his phone to prevent him from going downstairs²⁴

“The text service is really good and has not let me down once. It saves me from going downstairs to check – I’d be down even if I heard a creak at night but now I just check my phone to see I’ve locked the doors.”

Service user

“This text service has changed both our lives. For nearly five years he has been up all night checking locks and doors due to his anxiety so we got little sleep and it was very distressing as his carer. The difference has been amazing – we have got back to a normal life.”

Mother (main carer)

FIO & ASPERGERS – SO WHAT?

- Aspergers is a very individual condition but what is universal across the group is the preference to interact and respond to Flo rather than people.
- The unique use of Flo in alerting family/carers has resulted in this method of family involvement for long term benefits being incorporated into other areas.
- For one individual contact with the community support worker increased, however this was a positive outcome as the service user had previously declined intervention though recognised that they needed support.
- Larger cohorts would add to this evidence, but the impact can be seen at an individual service user level

²⁴ https://www.youtube.com/watch?feature=player_embedded&v=ojRCGOna3Ug

Section 5.7 Care Homes

A care home in Rushcliffe, have been using Flo to reduce the need for the Community Matron to visit unless vital signs readings indicate a visit is required. The carers, patients and family are all involved in the use of Flo. At a pre go live meeting with relatives and patients to explain how Flo works, some of the patients and relatives expressed the desire to send in readings. Flo went live on 19th September 2013 in the home and a review took place in December 2013 and it has been going well.

Table 34 – Summary of Costs/benefits

| Number of residents | Cost for 26 residents (inc Equipment) | Summary of benefits |
|---------------------|---------------------------------------|--|
| 26 | £2,073.29* (£79.74p per patient) | <ul style="list-style-type: none"> • Patients treated prior to condition deteriorating • Increased monitoring which enables clinicians to provide more proactive and timely care management • Reduction in admissions • Staff and family reassurance |

*Each resident was supplied with a mobile phone.

Each month patients are reviewed and at the last review a resident was identified as no longer requiring her medication. The resident had always been reclusive and depressed. Flo readings identified she could stop her medication and since then she is a changed lady, no longer depressed and joining in and active in the home.

Using Flo had identified three residents to the Community Matron that needed additional assessment which may not have been picked up previously. One individual's blood pressure was very high and the graph on Flo identified this trend to the Community Matron and the staff at the home. The staff feel reassured that they are giving the best quality care to the residents and requested that we now also introduce temperature monitoring only to be used if a resident appears to be ill. Instead of needing a GP to visit the staff can assess the individual using Flo and give the GP or Community Matron all the information about the resident and now know whether they have a temperature. We will continue to assess where Flo has reduced the need for a Community Matron or GP visit.

One resident has given the following feedback and is keen that people realise that just because they are in a home does not mean they need to understand about their health and what they can do to improve it:

"It is not enough to just take a BP, you need to know what it means and what I can do to look after myself".

Care home resident

This resident now has established a routine to monitor using Flo to support and:

- * walks with Zimmer frame to exercise machine in residential home
- * Diet changed

- * Keeps own diary of readings and progress
- * Notable change in motivation and lifestyle through monitoring

A video is available showing the outcomes from the staff and clinicians views²⁵.

FIO & CARE HOMES – SO WHAT?

- Changes to resident's quality of life and health are apparent
- Identification of low blood pressure will reduce the risk of falls amongst residents as medication titration can be done quicker and more effectively.
- NHS resources are used more appropriately and other homes are starting to use Flo based on this good practice.
- Further data is required to fully assess the outcomes of this intervention.

²⁵ <http://vimeo.com/89925078>

Section 5.8 Hard to Reach Groups – GypsyLife

GypsyLife teamed up with the Nottinghamshire Assistive Technology team to use Flo simple telehealth to support the community with health promotion. The Health Ambassadors from the Gypsy community attended a session to discuss how they could use Flo to help them. Some people have signed up for simple medication reminders and after agreeing this could be something very useful a session was arranged to target anyone interested in weight loss. Everyone signed up to Flo and will now start to receive health advice via text and also have a weekly weigh in with Flo via text. The group have even decided to start have a walking group encouraging them all to start exercising regularly.



Maria Keay a Dietician from the NHS also attended the session and gave a very interesting presentation on healthy eating and general advice. She taught them how to use a piece of string to do waist circumference and also warned about the amount of sugar and caffeine there is in certain energy drinks.



"We really enjoy working with you to launch Flo in our community, as we believe that Flo is an incredible tool for the GRT community to rely upon. We were amazed by the response from the ambassadors and It was a great day, everyone thoroughly enjoyed the event!"

Nathalie Bennett, GypsyLife.

FLO & HARD TO REACH GROUPS – SO WHAT?

- Working with transient groups/hard to reach groups can help them use local NHS resources more appropriately, in particular reducing A&E attendance.
- Building relationships to support health prevention and to educate the community.
- Flo can support changes in behaviour.

Section 5.9 Bespoke Case Studies

The following are other case studies and stories to represent patients and carers.

Case study 1 – Stroke patient

Patient A is in her early 50s and has recently suffered a major stroke which has left her unable to speak and walk. Throughout her recovery her blood pressure has been high which may have been a contributing factor in her having a stroke. She was very anxious and concerned that her high blood pressure would cause her to have another stroke.

During visits, the Community Matron suggested that the patient tries Flo to send in weekly BP readings. The patient was really pleased to start using Flo as she would be able to monitor her blood pressure and felt reassured and supported by the messages of advice received from Flo. The Community Matron has now transferred this patient's Flo record to the patient's GP surgery so that the nurse and GP could monitor her readings closely. This has meant that the patient has been able to continue to use Flo whilst the nurse and GP have the benefit of increased monitoring and are able to titrate medication accordingly to try to stabilise her BP and avoid the risk of another stroke.

Case study 2 – Medication reminder for patients with Parkinsons

A - The over the rainbow Parkinsons group recently had a talk about Flo. Keith who is the chairman had difficulty speaking and was using a walking aid at the group talk. Keith called and was keen to see if Flo medication prompts would help him ensure he took his medication on time. After only 3 weeks of being in Flo Keith called and speaking clearly explained what a difference it had made to his health and also he was now sleeping at night.

B - Ron has Parkinson's and always gets his medication on time because his wife as his main carer supports him. However his wife also has earlier stages Parkinson's and often forgets to take her own medication, which has resulted in her experiencing "freezing" episodes Flo has been set up to remind and prompt her to take her medication to ensure she can continue to care for Ron and herself. The patient has said the following:

"I do make sure now that I have my tablets upstairs and downstairs so when I hear a text message at the agreed time I take them. I don't always get to open the message as I am busy with Ron"

Carer with Parkinsons, age 68

Case study 3 – Landline uses

The landline use for Flo has been used as an alternative for those patients with no mobile or who are unable to use a mobile and further case studies can be found in appendix c. Two patients using landline for their diabetes have sent in their evaluation and their responses are below. Flo is used to remind them to take their insulin.

For the two patients who have responded to the evaluation, their feedback states that Flo is easy to use and helps them manage their own health better. Both agreed that it makes them feel reassured. Clinicians have stated that they feel it has definitely helped them manage their health and they have had a little fewer contacts.

Case study 4 – Seizures and Anxiety

At a practice Multi-disciplinary team meeting (MDT) a high admission patient was highlighted. The patient a young female aged 21 has been experiencing clonic tonic seizures and after lots of investigations Epilepsy was not felt to be the cause and that the seizures were anxiety induced. It was agreed that perhaps an innovative approach was required as the GP wanted to understand how often seizures were occurring but also support the anxiety. A protocol was written on Flo in collaboration with the patient with motivational support messages and advice based on the anxiety course the patient had attended. It also has a seizures diary and medication reminders as request by GP and patient. Further analysis will be done on the outcomes however this has been included in this report to again highlight the flexibility of using Flo.

Case Study 5 – Patient Self-referral

The different approach by practices highlighted in section 4.3.2 of this report is valuable advice and evidence on which best practice approaches succeed. One surgery took a unique “big bang” approach to introducing Flo to their patients and uses it for COPD, Heart Failure, Asthma, Hypertension, weight management and Diabetes. In the waiting area there is lots of information available for patients about Flo including an enquiry box so if they are interested in how Flo can help them manage their condition or just prompt for medication they fill in a slip and pop it into an enquiry box. The Practice reviews and then discusses with the patient whether Flo would be suitable for them to use.

The practice are now also exploring the use of Skype/FaceTime in conjunction with Flo to further exploit remote care monitoring and increase patient access to General Practice.

6. Overall Cost Analysis

The analysis indicates for targeted high admission patients, there can be a significant reduction and therefore high net savings. Patient quality of care and clinicians responses are overwhelmingly positive and reduction in visits and increased capacity for teams is evident.

- Across Heart failure (HF) nurse teams, home visits has reduced by between 32- 38%. One home visit costs £67. Florence, including all equipment costs £70.68 per year.
- COPD – In one team (Newark and Sherwood Community Team) there was only a small 5% decrease in face to face contacts and this is explained further in the analysis/clinician feedback. There was a 40% decrease in expected hospital admissions reported. One hospital admission costs £2000. Flo, including all equipment costs between £63.72 – £244.80 per year, depending on the protocol used.
- The speed of hypertension medication titration increased using Flo; this has a positive impact on a practices drug budget.
- In one practice, white coat hypertension identification has identified in 30% of patients. Prior to Flo, these patients would have been put onto medication. Another 25% who were already on long term medication were identified as white coat and this stopped a need for medication.
- Preoperative use of Flo for the detection of hypertension costs £3.15 which reduces the need for a clinic appointment (£70) and an avoided cancelled operation = £232. 58% of patients were hypertensive and therefore would have previously had their operation cancelled.
- For one patient with diabetes, since using Flo his hospital admissions have reduced by 90%. His cost of using Flo is £1.60 a day and based on his previous admission patterns, Flo avoided £8,000 in hospital admissions (August - September 2013).
- For a patient with comorbidities, clinical contacts reduced significantly post Flo; reductions in nurse/GP emergency call outs reduced from 20 to 4, admissions reduced from 2 to 1, paramedic call reduced from 4 to 1 and GP visits reduced from 12 to 4 . The cost of the protocol is £118.51 per year.
- ADHD clinic appointment reminders have turned a DNA rate of 55 % to 100% attendance in patients using Florence. The cost of Florence is 72p per appointment.
- Meal reminders for clients with Asperger's has reduced support worker visits and had a significant impact on maintaining independent living for the cohort. Overall cash avoidance for all of the service users was £6,808 in domiciliary care package provision. For the cohort service user's, care package requirements reduced by a combined 34.25 hours per week. Clients have personal budgets and are starting to replace paying £9.60 per hour for a personal assistant visit with the use of Flo.

COST ANALYSIS OF FLO – SO WHAT?

- If Flo was implemented with larger numbers of patients, based on the evaluation data so far, there are some significant cost savings to be made in terms of avoiding hospital admissions and more appropriate use of NHS resources for all long term condition cohorts
- For Flo users, there is no way of measuring the long term effect on their use of NHS resources and their personal health and wellbeing, but it has to be a positive impact.

7. Lessons Learned – what can we learn going forward?

Table 35 – Lessons learned

| | Issue/Background | Recommendations and Comments | Follow up needed |
|--|---|--|--|
| Evaluation form | The University of Warwick Digital Institute form was adapted for local use and has evolved through feedback and understanding what outcomes we are trying to measure. | Cund's evaluation highlighted the joint patients/clinician evaluation of Flo (appendix a). Therefore we should continue with this evaluation, but look at a slicker process, to increase response numbers. | Investigate online version/ use of survey monkey and/or text responses. |
| Self-care management - Clinician and Patient | Flo can support self-care and clinicians have reported difficulties in changing the way they work to support patients to self-management/care. | Relationships between clinician and patient have changed. This educational requirement has been escalated to CHP senior managers. | Highlight Flo as a tool to support self-management/care within organisational awareness and training events. |
| Data | Lack of data for some services/practices has meant even though over 660 patients have used Flo during 2013/14, data is not available for them all. | This has improved and service reviews post go live have helped to refocus and open discussion with services/practices, although it is often difficult to get a slot with all the key staff. Use data analyst required to go in to practices and services to support data collection based on good practice from other areas. | Use evaluation budget to explore better data collection over the next year. Consider concentrating on a deep dive of LTC areas. Work with clinicians to use Normalisation process theory (see section 6.1) Clarify how data is recorded and what constitutes an avoided admission or visit and increase GP data to identify if visits/appointments are reducing. |

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| | Issue/Background | Recommendations and Comments | Follow up needed |
|---------------------------|---|---|--|
| Medical devices | Different approaches and opinions in community and acute around best medical devices and ability to test. | Operational processes around maintenance of kit and responsibilities remain within individual organisations. | Avoid complex processes and additional costs. Work with Clinical engineering to agree best approach. |
| Action Learning Events | The action learning events were initially used to engage staff and encourage use of Flo and were very much led by the workstream. | These events have proved valuable and have now progressed to clinicians sharing their experiences and creating a network of users. At one event all attendees were asked to consider how Flo could be mainstreamed and this is found in Appendix B of this report. | Continue with ALE events and encourage use of online forum in between events on the NHS networks site. |
| NHS Networks site | Working across all organisations it was important to have a location to share updates and important information which could be access controlled. | The site is kept up to date but there are still small numbers of members and no forum discussions. | Further encourage use. Blogs from clinicians and more advertising as a resource. . |
| Patient groups | There has been an increase in demonstrations and requests from carer groups etc. | Continue to engage with other patient groups. Utilise these groups to use their suggestions for protocols and messages | Patient champions Ask national team to consider creating an online Flo patient forum. |
| Clinical champions | Knowledge of Flo is limited in some areas | AHSN funding for Clinical project manager | Increase clinical advocate role in different services/specialties. |
| Enhanced Service Model | Developed to support services who have a low uptake due to time constraints. Lack of use in PRISM virtual ward teams cited lack of time as reason for not widely using Flo and concern it will replace nurses | The enhanced service model supports CHP/BHP and other services to engage and increase patient numbers by the Flo team enrolling patients and then referring the patients back to their Clinician workload within the Flo system. | Highlight this enhanced service throughout the County. |
| Link Flo to new QOF/DES's | Added value of using Flo for practices with the new unplanned care DES and to support QOF. | Work with general practice/CCG service development managers/data analysts to identify patients whose utilisation of acute and other NHS services is high. | Review QOF targets and NICE guidance and see where Flo can support |

7.1 Links to Theory

The Normalisation process theory (NPT) (Murray et al, 2010)²⁶ is a framework for developing, evaluating and implementing complex interventions. Although Flo is 'simple' telehealth, the perception of introducing any change though this is a different context and not a clinical trial, it is often addressed in the same way by some staff groups. Lessons from the theory can be applied and used to understand examples such as Practice A and the GP response to using Flo for identification of white coat hypertension being time consuming in section 4.3.2 of this report, yet another practice finding the opposite. In Practice A Flo was not continued and there are a number of factors we can draw from this.

Flo does not work where:

- Practices rely on one person (nurse or GP)
- No buy in from all the staff
- Size of practice
- Slow behaviour change

Four main components of NPT highlight: -

- Coherence (or sense making)
- Cognitive participation (engagement)
- Collective action (all staff work collectively to enable the intervention to happen)
- Reflexive monitoring (formal and informal appraisal of the benefits + costs of the intervention)

What NPT highlights, is the need to distinguish clearly between the intervention which would continue and evaluation without the intervention. In their example of introducing a new enhanced physiotherapy service available to refer patients to (Murray et al), the pressure of time and the complexity of a consultation shape the context in which GP's work: -

"the intervention had low coherence for participating GPs, who mainly focused on one aspect, (the clinical support tool), which did not make sense to them. Because of this low coherence, there was low cognitive participation, with the GPs seeing little point in the intervention, which led in turn to low collective action (an unwillingness to invest time or energy in implementation), particularly as the intervention required a change in consultation behaviour" (Murray, 2010, p.3).

Some practice and services processes normalised over time are not always good and efficient. The NPT paper describes *"Despite regular feedback from the research, the GPs did not perceive benefits to the new system as they did not use it enough"*(Murray, 2010, p.4).

The final point that backs up our feedback from clinicians is that:

"Providing self-care support may require clinicians to challenge current patient behaviours and risks disrupting existing relationships" (Murray, 2010, p.6).

²⁶ Murray et al (2010) "Normalisation process theory: a framework for developing, evaluating and implementing complex interventions" BMC Medicine 8:63 <http://www.biomedcentral.com/1741-7015/8/63>

8. Conclusions

Flo is now in use across every Nottinghamshire CCG and is demonstrating some very positive outcomes, however it is not universal in its use and spread and needs further deployments to show its true potential to support current challenges faced by all parts of health and social care, and to join together health and social care organisations, patients and carers.

The evaluation has given us an insight into quality improvements, clinical benefits, cash avoidance and behaviour change brought about by the use of Flo. Patient reported outcomes are consistently positive and the minority negative comments help to improve the use of Flo and stresses the need to appropriately assess a patient's ability to use it.

The patient stories are powerful and will support spread and diffusion, and also are valuable clinical engagement tools. Where Flo is used for long term conditions (LTCs), observations made by (Kay, 2013) about the nature of LTCs are validated further. Exacerbations do occur and this can mean an increase in contacts or no change, this is the reality of working with patients with complex needs.

"Flo offers a simple yet innovative way to assess, monitor and evaluate a patient's health lifestyle and behaviour. This has the potential to change the way consultations are structured and facilitated for some patients (but not all)" (Cund, 2014)²⁷

Flo is slowly supporting care management in line with changes in relationships between patients and their clinicians to assist in embracing the model of self-management/care. Some patients want empowerment and have the ability to improve their lives through self-management and better understanding of their condition. Flo is also preventative and further uses in public health could potentially improve the education and understanding of patients for the long term benefit.

The majority of practices and services have recognised benefits to patients and clinicians and responded positively, however there is still a degree of uncertainty in some areas especially in general practice to the added value and what exactly Flo can do. A more proactive marketing approach may be required for 2014/15 with more case studies showing individual patient outcomes and the flexibility of the solution. It was over ambitious to think that Flo could be fully mainstreamed in 12 months, however there are pockets of practices/services where it is becoming business as usual.

Further data and analysis is required for all outcomes to provide validation. Evaluation data is collected on an on-going basis and should be used to identify the most appropriate and efficient uses of Flo. As the interim evaluation (Kay, 2013) recommended, greater detail is required to develop consistent criteria of what constitutes an avoided admission or appointment.

²⁷ Cund A (2013) *"Self-management: Keeping it simple with Flo. Findings from an interim evaluation"* (unpublished)

The NHS change model highlights the importance of our outcome data being transparent and we need to work more closely with teams to achieve this. This first evaluation report from the workstream is the start of this process.



9. Implications for the Assistive Technology Workstream

The work stream has the knowledge, effective project management processes and ability to gain clinical buy in introducing innovations such as Flo. The team have reflected on the lessons learned from this report and will ensure they are acted on and reported in the next evaluation report.

We need to ensure we proactively promote the flexibility of Flo to enhance further take up of the service and ensure as many patients as possible are able to benefit.

We need to create a sustainable service that provides low cost but highly effective results.

We need to apply our learning from data collection and evaluation and seek further support to make improvements to the latter.

Finally, we need to recognise the valuable contribution we can make to support all Organisations as they face their continuing financial challenges and demand on services.



Nottinghamshire Health & Social Care AT Workstream

Questionnaire about the Florence Service

This form helps us understand your views about Florence, so we can improve the service we give you. We need your mobile number to link information on this form to information Florence collects, but you are still anonymous as no one analysing the results knows whose mobile number this is. Many thanks for your help.

About you:

Your mobile number: _____ Your age: ____ years Your gender: *Male / Female*

About your experience with using Florence:

Please read each statement below, then tick a column to show how much you agree or disagree with it. If you want to tell us any more about any of these topics, please write on the back of this sheet. Thanks.

| | Strongly agree | Agree | Disagree | Strongly disagree | Not applicable |
|---|----------------|-------|----------|-------------------|----------------|
| 1. Staff can get a good understanding of my health problem using Florence | | | | | |
| 2. I feel confident that Florence protects my personal information/data. | | | | | |
| 3. Florence is easy to use | | | | | |
| 4. I feel comfortable using a mobile phone with Florence | | | | | |
| 5. I feel confident that sending my readings to Florence makes a difference. | | | | | |
| 6. I feel I have learned more about my condition and what works best for me. | | | | | |
| 7. Florence is helping me manage my own health better | | | | | |
| 8. Florence is improving my general health | | | | | |
| 9. The lack of human contact when I use Florence does not bother me | | | | | |
| 10. I find Florence very convenient | | | | | |
| 11. Florence saves me time | | | | | |
| 12. I feel very reassured that Florence is helping me manage my health and wellbeing | | | | | |
| 13. I feel that Florence supports the existing care I receive | | | | | |
| 14. I have more meaningful communication with my doctor/nurse as a result of Florence monitoring my health. | | | | | |
| 15. Regular contact with Florence means I need to visit my GP less often | | | | | |
| 16. I believe that Florence should become a standard service in the future | | | | | |
| 17. I would recommend Florence to a friend or family member. | | | | | |

For your health or social care professional to complete [Please enter number or ring the answer that applies best]:

N1. For how long has this person been using Florence? ____ weeks / ____ months

N2. Do you believe that using Florence has helped them to manage their own health and wellbeing better?
Definitely yes / Probably yes / Probably no / Definitely no / No change

N3. Have you had more or fewer contacts with this person since they started using Florence?
A lot more / A little more / A little fewer / A lot fewer / No change

N4. Have your contacts with this person been more or less appropriate since they started using Flo? *Definitely more / Probably more / Probably less / Definitely less / No change*

N5. N5. Has the use of Flo with this person avoided any hospital admission? *Yes / No If yes how many?*

Clinician

Service/Practice

Appendix B – Mainstreaming responses from Clinicians

As part of the Flo user event in May 2013, attendees were asked to provide feedback about what we need to consider when planning for the mainstreaming of Flo by the end of this financial year, this is a summary of responses

Quality

Increases patient satisfaction (3)
 Care Closer to Home
 Increases patients ability to manage their own condition (5)
 Supports patients self care agenda
 Decreases anxiety
 Allows patients to be monitored following discharge
 Reassurance to both patients and carers (3)
 Patient driven (3)
 Patient support
 Adaptive, flexible, bespoke & simple
 Increases patients confidence
 Motivational, helps deliver the public health agenda (2)
 Less patient time wasted waiting for nurse or visit or attending clinic
 Increases quality of care/life(3)
 Clinical engagement
 Enhances routine care
 Simple to use
 Meeting individual needs
 Support integrated care

Productivity

Increases clinical productivity (7)
 Reduces inappropriate appts/visits and travel time (5)
 Reduce DNAs(6)
 Reduces face to face contacts(7)
 Increases caseload(3)
 More efficient/effective service (2)
 Normalise it-accessible to all
 Saves time (2)
 Reduces waiting lists for people who do not need treatment
 Releasing clinical time to care at the most appropriate level
 Improved access to clinics
 More effective way of delivery care
 Improving the experience of staff
 Way of providing more support from Health & Social care systems
 Utilise workforce appropriately

Cost benefits

Cost effective (3)
 Save in petrol costs
 Value for money
 Cost benefits to NHS and patient (2)
 Reduces urgent and planned care activity
 Costs offset through improved productivity
 Reduces cancellation of operations(2)
 Reduces wasted resources (2)
 Meets QIPP agenda(2)
 Improving quality within a sustainable cost envelope
 Diversity of use

Clinical Benefits

Reduces long term complications associated with LTC poor control
 Clinically effective
 Better health outcomes (2)
 Proactive titration of medication
 Reduce hospital admissions (2)
 Provides clinical evidence (2)
 Improves compliance and concordance
 Delivers evidence based care