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Improving adherence to diabetes treatments with technology enabled care

Dr Parijat De describes how his team at Sandwell and West Birmingham Hospitals are using mobile technology to improve care and education of people with diabetes.

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Person-centred care

Key recommendations

- It is important to create interest in the department and establish a dialogue to convince key stakeholders within the trust/department about the benefits of such an initiative (a big initial challenge).

- It is paramount to engage staff at all levels; the trust/directorate must be informed about the clinical and financial benefits of this form of telemedicine service.

- Time must be taken to ensure patients are on board and understand the usefulness and benefits of telemedicine.

- Agree an end date to the text reminders so patients know that either the process has worked and they no longer needed them or that the protocol had ended ('Florence' or 'FLO' is a mobile phone texting system for healthcare. FLO telemedicine protocols usually last 8 weeks).

- Allocate time for viewing FLO data on a weekly basis and allow extra time for responding to data within job planning.

- Ensure onward communication with GPs happens regularly especially with each blood pressure (BP) medication dose adjustment or after any new drug addition.

- In the early stages make time to discuss every individual case with the diabetes specialist nurse (DSN) or doctor using FLO to instil confidence and ensure the right decisions are taken to aid future autonomy. We found as time progressed and expertise was gained, this became a minor issue.

The challenge

Compliance is a major issue in diabetes, particularly, medication adherence in blood pressure (BP) control and blood glucose (BG) testing in adolescent diabetes. In in the ethnically diverse population of Sandwell, west Birmingham, compliance can be especially problematic.

A third of adult patients with type 2 diabetes need three or more tablets to control their BP to target levels. Often, patients with diabetes and renal disease take five or six different BP medicines.

Education is an important aspect of adherence. Patients need to understand the implications of strict BP control and this knowledge can help them take ownership of their health and improve their long-term prospects.

There is a great need to engage with type 1diabetes adolescent patients. It is particularly important for these patients to be reminded of the important of complying with blood glucose testing (three or four times a day) and taking their insulin correctly (often four times per day) on a regular basis.

Our solution

We choose to take an innovative approach and adopt 'Florence' (FLO) – a mobile phone texting system for healthcare. FLO texts advice to patients and collects up-to-date information about their health.

FLO uses a free text service for all patients in the UK. It doesn't cost patient anything to use, as texts are paid for by NHS organisations. FLO is a tool to help clinicians develop innovative and practical ways to help patients help themselves. It's cost effective for the NHS and works for patients with even a basic mobile phone.

FLO can improve adherence to treatment and engages patients in their own health plans through encouragement, automated reminders and regular contact. Messages can be pre-set at regular intervals as per patient and clinician needs.

Patients measure their own BP at home (using machines they own themselves or borrow from their healthcare provider). They are encouraged to check BP two or three times when they wake up and to send the best/average BP readings through FLO. This information is saved on the secure FLO website, and is available to health professionals. If the health professional identifies a significant change in metrics, they are able to text the patient and alter their medication (dose/type) as needed.

When patients are introduced to FLO they are made aware at the very start that staff cannot and will not respond to issues urgently through this system. There is a good overlap with doctors and nurses working jointly such that when someone is on leave, readings can be transferred to the other person who can respond as needed. FLO also regularly collects self-reported data and provides instant feedback; enables improvements in clinical team productivity and outcome.

Outcomes

Quantitative outcome measures

To date a total of 76+24=100 patients have enrolled on to FLO so far for BP module and 9+6+11=26 for BM and insulin reminder since April 2014 (2 years) exactly.

Of the 76 for BP, BP medications have been adjusted (added or increased dose) in 16+6+5/100 (27%) where I continue to follow them up in FLO and have discharged 27+19/100 (46%) with good BP either having just monitored their BP to adjust their medications. This should result in reductions in Urine ACR and stabilisation of renal function as BP control is vital in such patients with diabetes and renal disease.

In total this has prevented 39+6=45 (for those I continue to f/u) + 43+19= 62 (for those that I have discharged) = 82+25=107 OP attendances or face to face consults thus saving us £8200 (£10,700) in 2 years (£100 per OP attendance) simply from BP management for my patients with difficult diabetes renal disease.

This is against a total cost of £3, 115 assuming all 107 patients have used the WMAHSN Hypertension CKD/diabetes protocol for the full 12 weeks (equates to 364 texts/patient, cost per patient being £29.12 for the service).

FLORENCE: all protocols used by Sandwell and West Birmingham Team

Row labels
Sandwell and West Birmingham Acute
Sandwell and West Birmingham diabetes team
E012 Motivational wt mgt messages
Gen Stop Smoking Protocol (12 weeks)

Person-centred care

WMAHSN-07 Hypertension poor control of newly diagnosed v2
WMAHSN-08b Hypertension x1 weekly
WMAHSN-08b Hypertension stable, weekly check
WMAHSN-09 Hypertension poor control, CKD or diabetes v2
WMAHSN-10 Medication reminder for adults and teenagers v2
WMAHSN-32 Nottingham BG monitor x5 daily
WMAHSN-52c Insulin reminder for adolescents T1DM & pump use
WMAHSN-53 Blood Glucose reminder for adolescents
WMAHSN-54a Blood glucose reminder adolescents/T1DM/pump use
WMAHSN-54c Blood glucose reminder adolescents/T1DM/pump use

Qualitative outcome measures

Patient testimonials

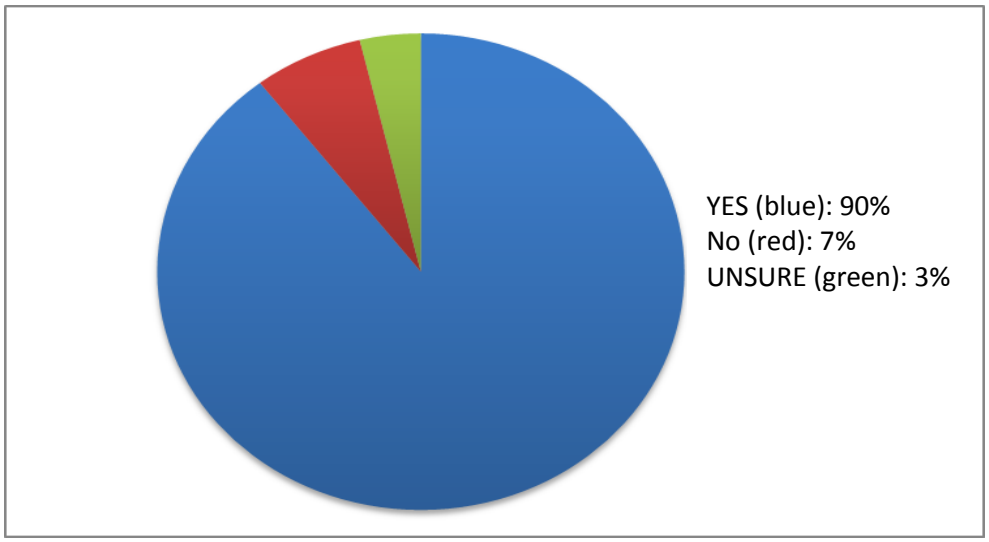
> *'FLO messages for BP were very motivational and helped me increase my activity levels and improve my diet.'*
>
> *'Using FLO on my tablet is so easy and convenient; I am partially sighted and can enlarge the text. I use FLO for BP and periodic BG testing which I have found very helpful recently changing from basal insulin.'*
>
> *'FLO feels more like a friend you can trust than a computer system" was the quote patient used in the case study above.'*

Patient feedback

The first two charts A and B relate specifically to the hypertension and medication reminder protocols and the final question was posed to all patients using the protocols.

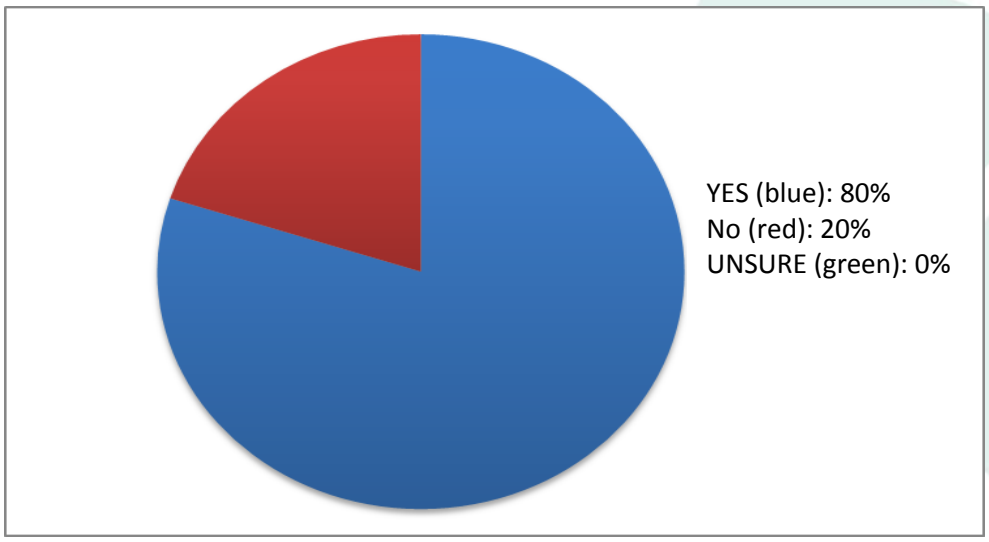
The questions were asked in 2015.

A. Hypertension – Are you confident about taking your blood pressure at home?

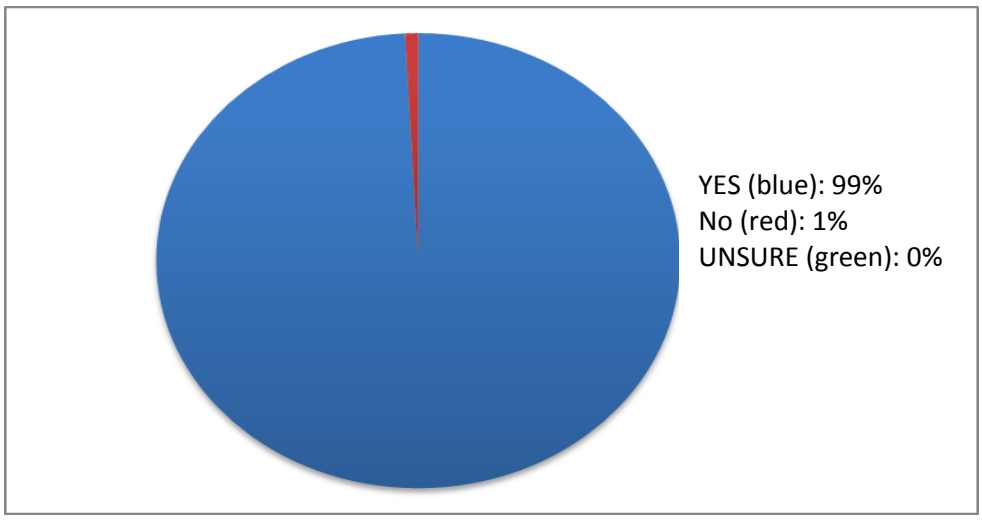


Person-centred care

B. Medication reminder – Does FLO help you to remember to take your tablets regularly?



C. Patient preference – Do you prefer to text readings your readings to FLO?



Benefits and impact

- Improved compliance and concordance with antihypertensive medication.
- Better self-management of own long-term condition (blood pressure) by patients.
- Improved ability and confidence to adjust own BP medications/insulin dose.
- Excellent BP control achieved for the complex patients with diabetes and renal disease.
- Ability to safely discharge patients back to GP – in those where target BP achieved and those with diagnosis of 'white coat hypertension'.
- High satisfaction of patients with health service.
- Reduced numbers of clinic visits, specialist nurse contact and hopefully, less hospitalisation in future from engagement, improved knowledge and collaborative working.
- Useful information and insight gained from patients about lifestyle and habits which impact on adherence.
- FLO gives patients their freedom back (patients aren't tied to a machine at home or visits to surgery or hospital. They take BP or BM readings at their convenience whether at home with family or on holiday).

Person-centred care

- FLO gets patients more involved (regular, personalised health tips and medication reminders are sent to patients based on their readings. They become more involved and take more responsibility for their own healthcare).
- FLO gives patients confidence (frequent, short messages are unobtrusive and help the patient feel more cared for, more involved, and more in control of their own healthcare).

Methods

Simple Telehealth/FLO (STH/FLO) is one main mode of digital delivery currently sponsored by NHS England in a national rollout; and is building the evidence base for enhanced effectiveness and efficiency of technology enabled care services (TECS). STH/FLO is already used in around 70 organisations across the country and the number is growing.

We took the opportunity to join the Central Spoke cluster focus on (STH/FLO) via West Midlands Academic Health Science Network (WMAHSN) who were investing in the rollout of (STH/FLO) to enable remote interaction between patients and clinicians via mobile phone texting. STH/FLO has been previously shown to enhance clinical management and is positively welcomed by patients.

We had to commit to a minimum of 12 months activity and received free usage of the STH/FLO service inclusive of 37,500 texts, in relation to the LTCs/medication reminders focus of the project (particularly in our hypertensive diabetes patients with chronic kidney disease and adolescent diabetes population) with technical and administrative support from the STH team. Subsequently, this process would cost the Trust/CCG £10,000 for 37,500 text usage over the next year.

We concentrated on the key protocols of, blood pressure reminders (once weekly, once monthly) in CKD and diabetes patients, high initial BP readings for diagnosis, poorly controlled hypertension, and medication reminders.

Other clinical protocols on offer and used by the diabetes team include:

- weight management
- medication and insulin reminders - adults and teenagers (T1DM, insulin pump)
- managing mood and anxiety
- blood glucose testing reminders
- stress.

Key learning

It was important to tell patients about the utility of the texting interactive service and its benefits and give them time to warm to the idea. Not all patients understood the principles straight away and often, we have had to give them information and time to think about it and come back.

The majority of patients understood and enrolled straight away, a few elderly patients struggled to come to terms with the concept of texting their BP readings and we had to decide not to enrol these patients.

The service can be adjusted: we modified the FLO reminding service to send once/twice weekly reminders rather than daily reminders for the patients that requested this. We also ensured patients understood how to stop text messages, for a period of time (eg if on holiday) and discussing this was very useful at the very start.

What's next?

The diabetes team started using FLO in 2014. There has recently been an increase in our local clinical engagement with FLO and, as a result, uptake in SWBH is continuing to grow, with new user accounts

already set up and protocols in various stages of development to support pathways for the following new teams – Pharmacy, Respiratory, Paediatric Diabetes, Haematology and Occupational Therapy.

In April 2016, within the diabetes team 76 patients being supported by FLO and with the increase in clinical engagement and the addition of five new teams in April, we expect that the patient numbers will likely increase significantly in the coming months.

Several teams have requested training sessions and there is significant interest from other specialities to replicate our work and use this technology in managing various aspects of other long term conditions.

With this momentum gathering and the wider possibilities of where FLO can support SWBH in the achievement of its wider objectives, we plan to involve the acute sector as well, recognising the need to support patients outside of traditional face-to-face care typically to improve self-management resulting in achievement of faster clinical outcomes or to improve team productivity and release non-urgent capacity.

Recently, five organisations nationally have received praise from the CQC with FLO cited as 'outstanding practice' for the management of long-term conditions within reports – we hope that this will happen with our Trust as well. In due course, the plan is to work with interested clinicians within our Trust to develop protocols for clinical management of other long term conditions.

We have also recently been offered the STH/FLO protocols for Workforce Stress FLO Telehealth sub-project made available for up to 30 of our staff (if any perceive themselves to be stressed to provide confidentially for all staff outside of the organisations' own support) without any charge: Stoke-on-Trent CCG is funding the text costs from external funds from the charity, The Health Foundation. Our Occupational Health Team recently has started this project.

Who's involved?

Dr Parijat De, consultant physician and project lead
Susan Irwin, diabetes specialist nurse
Jagjit Kaur, diabetes specialist nurse

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