**Evaluation of A Referral Pilot Of Patients At Hospital Discharge For Domiciliary Medication Review In South Sefton Clinical Commissioning Group**

**Introduction**

Hospital discharge is a period of transition from hospital to home that involves transfer in responsibility for care from the inpatient provider to the patient and the primary care team [1]. Inadequate communication and insufficient care co-ordination are common challenges during transfers of care.

Previous research has shown that 45% of medicines prescribed on discharge are new [2]. Nearly two thirds of patients have three or more medicines changed during their hospital stay, and the likelihood that an elderly medical patient will be discharged from hospital on the same medication they were admitted on is less than 10% [3,4].It has been reported that between 30 and 70 per cent of patients have either an error or an unintentional change to their medicines when their care is transferred [5].

Adverse drug events (ADEs) are the most common type of adverse event reported following discharge from hospital,occurring in 10-20% of patients after discharge [6,7]. Almost all ADEs occurring post discharge are caused by new or altered medication rather than those unchanged from pre-admission [6]. More than half of these ADEs may be preventable or ameliorable (ie, duration or severity could be decreased) [6].

Reasons identified for post-discharge ADEs include:

* Poor communication during transitions in care, both between healthcare professionals and patients and between professionals in secondary and primary care
* Lack of monitoring and review of treatment
* Patients not taking their medicines as agreed (non-adherence) [6-8].

Up to half of post discharge ADEs may result in a visit to the family doctor or hospital emergency department, or a readmission to hospital [6]. In 2012-13, 19% of the 5.3 million emergency admissions to NHS hospitals were readmissions [9]. It has been estimated that each readmission costs the NHS £2114 on average [10]. Therefore, emergency readmissions to hospital cost the NHS over £2.1billion each year.

Approximately one-fifth of re-admissions are related to medication and up to half of these may be preventable [11,12]. Therefore investment in improving medicines related transfer of care may represent a rational ‘first step’ in reducing the risk of readmission, with potential annual cost savings of anywhere up to £210,000,000 for the NHS.

In 2009, the Care Quality Commission (CQC) report *Managing patients’ medicines after discharge from hospital* found that information shared between GPs and hospitals when a patient moved between services was often patchy, incomplete and not transferred quickly enough [13]. Recommendations included a review of the number and deployment of pharmacy staff providing support to GP practices to provide a greater focus on post-discharge medication reviews and adherence support, particularly for complex or older patients. Both acute trusts and primary healthcare professionals were urged to ensure that they communicated more effectively with patients about their medicines, both at the point of discharge and after return to the community.

The need to improve discharge information and patient education around medicines was highlighted again by a Department of Health (DoH) action plan to improve the use of medicines and the Royal Pharmaceutical Society (RPS) guidelines on transfer of care and medicines optimisation [14-16]. All of these papers make reference to the importance of post discharge medication reviews, and advise hospital pharmacists to collaborate more with pharmacists in primary care. The NHS tariff of payment to secondary care providers also specifically recommends more collaborative working and better coordination of clinical intervention with community and social care providers [17].

It has been suggested that the brief period prior to discharge is not an ideal time to convey new and complex information to older patients, as pain, anxiety, sleep deprivation, or delirium may limit receptivity to new learning [18]. Furthermore, at hospital discharge patients may be overwhelmed with information, at a time when their primary concern is to get home as quickly as possible [19]. However, once at home, patients (and their family members) are abruptly expected to assume a significant self-management role in the recovery of their condition and in the management of their medications, for which they may feel unprepared [18]. It has recently been shown that post-discharge domiciliary medication review by a consultant pharmacist can improve quality of care and patient safety for high risk older people [20].

**Project Background**

South Sefton Clinical Commissioning Group (SSCCG) medicines management team (MMT) has been part of the CCG’s multidisciplinary Virtual Ward (VW) since 2014. Each locality within the CCG has an assigned pharmacist and pharmacy technician who receive referrals from community matrons, GPs and other members of the VW team for patients assessed as being at risk of medication related problems. The VW-MMT provide domiciliary medication reviews using the Medicines Use Review (MUR) model to deliver the consultation. The MUR is predominantly an adherence review, which:

* Provides medicines optimisation to support adherence
* Establishes the patients actual use, experience and understanding of their medicines;
* Identifies, discusses and resolves poor or ineffective use of patients medicines;
* Identifies side effects and drug interactions that may affect compliance;
* Improves the clinical effectiveness and cost effectiveness of prescribed medicines
* Potentially reduces medicines wastage.

As an extension of the VW service, VW-MMT in the Bootle locality of South Sefton undertook a pilot project with Aintree University Hospital to receive referrals from the hospital pharmacy for a domiciliary medication review with the patient and/or carer as appropriate, following hospital discharge.

Aim: To provide a domiciliary medicines reconciliation and MUR service for high risk groups of patients who have been recently discharged from hospital.

Objectives:

* Contribute to a reduction in risk of medication errors and adverse drug events by increasing the availability of accurate information about a patient’s medicines
* Improve communication between healthcare professionals and others involved in the transfer of patient care, and patients and their carers
* Increase patient involvement in their own care by helping them to develop a better understanding of their medicines
* Improve medication adherence through medicines optimisation
* Reduce the volume of medicines that are wasted when unnecessary, or duplicated prescriptions are dispensed
* Reduce medicines-related admissions/re-admissions to hospital or care homes which can occur when unreconciled medicines lead to prescribing or administration errors
* Utilise the specialised knowledge and skills of pharmacists, recognising the contribution that they can make in optimising medicines use
* Signposting and referring patients to the VW multidisciplinary team for further support if other needs are identified by the MMT, facilitating a holistic approach to patient care.

**Method**

During the 6-month pilot period, hospital pharmacists and pharmacy technicians identified patients admitted to either the stroke ward or acute admissions unit that fitted the project’s inclusion criteria (Box 1). Referral criteria were developed jointly during a brainstorm by the hospital and CCG MMTs. The hospital pharmacist/technician discussed the purpose of the project with the patient and gained consent for referral to the VW-MMT.

**Box 1: Inclusion and Exclusion Criteria**

Inclusion Criteria

* Registered with a GP practice in the Bootle VW locality in South Sefton
* At least one of the following referral criteria:
	+ Difficulties in managing medicines
	+ Would benefit from further education on the use of their medicines
	+ At risk of falls which may be related to the medications they are taking
	+ Recent changes to their medicines which may need explaining
	+ Recent unplanned medicines related hospital admission
	+ High risk medication (as per hospital rating system)
	+ AKI related readmission
	+ May have unwanted medication in home as a result of recent changes
	+ Other (details to be provided)

Exclusion Criteria

* Patient lacks capacity to consent to VW referral and consent not possible from carer/relative
* Palliative patient
* Care home patient
* Elective day case
* Pregnancy

For each consenting patient, a referral form was completed and sent via secure email to the VW co-ordinator in the Bootle locality with a copy of the patient’s hospital discharge letter. The VW co-ordinator then sent the referral to the Bootle VW Pharmacist and Pharmacy Technician who arranged and carried out a domiciliary visit within two weeks of discharge. Feedback was provided to the patient’s GP and community pharmacist as required. The VW-MMT could, with patient consent, refer to other disciplines on the VW if other needs were identified and further support required.

Follow up telephone calls were undertaken by the VW-MMT team at 5 and 13 weeks following hospital discharge.

Outcome Recording

All visits were documented on the VW ‘sharepoint’ by the VW-MMT and interventions made were categorised under the following headings:

* Medicines optimisation (eg regimen simplification, dose optimisation)
* Medicines education/counselling
* Medicines adherence advice
* Inhaler technique check / advice
* Compliance aid initiation including blister packs
* Patient education (eg understanding medical conditions, disease management, lifestyle advice)
* Waste medication
* Controlled Drug issues
* Critical incidents
* Signposting to other members of VW MDT
* Hospital admission avoidance

To assess the potential clinical impact of interventions made during the project all interventions were collated and reviewed by a panel of 2 CCG pharmacists, 2 hospital pharmacists, 2 hospital doctors and 2 GPs. Twenty interventions were circulated to the panel by email and Delphi methodology used to arrive at consensus. The Delphi process is a group judgement technique in which contributors individually respond to survey questions and submit the results to a central coordinator [21]. The coordinator processes the contributions and results are then fed back to the respondents. The respondents are then asked to resubmit their views, assisted by the input provided by the coordinator. This process continues until the coordinator sees that a consensus has formed.

For the purposes of this evaluation, consensus was defined as 75% agreement between participants’ scores [22]. In addition, consensus can also be achieved when stability of the distribution of scores occurs; for example if variation between rounds is less than 15%, a state of stability is said to exist [21,23,24]. This process resulted in each intervention being assigned a value according to the Eadon-ScHARR scoring criteria (Table 1) [25,26].

**Table 1: Eadon Scoring System**

|  |  |  |
| --- | --- | --- |
| **Intervention type** | **Score** | **ScHARR Cost Avoidance (£)** |
| Intervention which is detrimental to the patients well-being | 1 | 0 |
| Intervention is of no significance to patient care | 2 | 0 |
| Intervention is significant but does not lead to an improvement in patient care | 3 | 0-6 |
| Intervention is significant and results in an improvement in the standard of care | 4 | 65-150 |
| Intervention is very significant and prevents a major organ failure or adverse reaction of similar importance | 5 | 713-1484 |
| Intervention is potentially life-saving | 6 | 1085-2120 |

Patients’ medication adherence was assessed by asking patients three medicines adherence questions at the beginning of the review and at the 5 and 13 week follow up telephone calls (Box 2). These questions had previously been developed using a PDSA (Plan, Do Study, Act) process by the SSCG MMT. Changes in scores following a VW-MMT domiciliary review were calculated.

**Box 2: The three medicines adherence questions**

1. Do you have any problems understanding what your medications are for?
2. Have you been unable to take, or forgotten to take your medications in the last two weeks? \*
3. Do you struggle to use, swallow or manage your medications?

Score the answers to each question (0=No, 1=Yes for some medicines, 2=Yes for all medicines) and document the total score out of 6.

**\*** It is noted that when the patient is first asked this question (Q2) post hospital discharge, the time the patient has actually spent in hospital may need to be taken into account

Financial savings to the CCG from medicines that had been stopped, and/or identified as not required, that would otherwise have been wasted, were calculated on an annualised basis.

Any hospital re-admissions that had occurred since the initial review were documented.

**Results**

During the six months September 2016- February 2017, 22 patients were referred to the VW-MMT by the hospital pharmacy. One of these did not fit the inclusion criteria as they lived in a care home. This patient was referred on the care home MMT. Three patients subsequently declined input from the team despite having consented to the service whilst in hospital. A further two patients were re-admitted to hospital before the first visit from the VW-MMT (ie within two weeks of their original discharge). Therefore a total of 16 patients received a domiciliary medication review from the VW-MMT following referral from the hospital.

Reasons for referral

The reasons for referral for all 21 patients initially recruited to the service (excluding the care home resident) are displayed in Figure 1. Most patients had more than one reason for referral.

Interventions: Nature

The number of patients receiving each type of intervention from the VW-MMT are summarised in Figure 2. Some interventions were classified under more than one heading.

All 16 patients visited received some form of education regarding their medicines and 87.5% received lifestyle advice, information regarding their medical condition or some other form of education regarding disease management. Half of all patients were offered some form of medicines optimisation to make their regimen easier to manage. A third of all interventions were classed as ‘critical’ by the VW-MMT.

Interventions: Clinical significance

All Delphi panel members returned Round One surveys, and, following analysis of these, were sent a Round Two survey. Six participants (all 4 pharmacists, one hospital doctor and one GP) returned Round Two surveys.

Following Round Two, >75% agreement in scores was achieved for 12 of the 20 interventions. When the percentage changes in each intervention’s mean score between Rounds One and Two were calculated, the variation was less than 15% for all interventions. This indicated that participants were not likely to alter their scores very much if a third round was undertaken and there was a risk of further drop-outs. A decision was therefore made not to progress to Round 3.

The mean score awarded each intervention was taken as the final estimate of the significance of that intervention. Scores were rounded to the nearest whole number to allow a value to be assigned to that intervention using the Eadon-ScHARR model (Table 2).

**Table 2: clinical significance of 20 interventions made by the VW-MMT during post discharge domiciliary medication reviews, and associated cost avoidance**

|  |  |  |
| --- | --- | --- |
| **Intervention** | **Eadon Score** | **ScHARR Cost Avoidance (£)** |
| 1. Patient started on dabigatran in hospital, warfarin stock removed from home
 | 4 | 65-150 |
| 1. Patient had been using Relvar & Incruse inhalers twice daily as directed by hospital discharge summary instead of once a day. Advised patient to only use once a day
 | 4 | 65-150 |
| 1. Patient was omitting all medicines (allopurinol, atorvastain, carbocisteine, sodium bicarbonate, levothyroxine, lansoprazole, apixaban). No package of care arranged by AUH as patient had son at home. However son had left and patient had no care. Referred to Crisis team. Medicines stopped as no longer clinically indicated: Allopurinol, Carbocisteine & Ketovite
 | 5 | 713-1484 |
| 1. Clarified lamotrigine titration dose
 | 4 | 65-150 |
| 1. Query over darifenacin, GP confirmed should have stopped this November 2016 however, patient had excess stock and was still taking it
 | 4 | 65-150 |
| 1. Fluoxetine stopped and sertraline started as per mental health team (letter had been at GP surgery for 1 week but not actioned)
 | 4 | 65-150 |
| 1. Patient given generic orodispersible lansoprazole from hospital, however requested branded Zoton due to previous intolerance to generic. Prescription changed to brand.
 | 4 | 65-150 |
| 1. Aspirin stopped by hospital as started warfarin. Both items were on the patients repeat medication at GP surgery and prescriptions were being issued. (Patient had NOT been taking aspirin as was aware of change and advice from hospital).
 | 3 | 0-6 |
| 1. Request from hospital to switch from amlodipine to doxazosin had not been actioned by GP. Switch completed after matter raised by medicines management team. Follow-up BP monitoring co-ordinated
 | 4 | 65-150 |
| 1. Assessed for blister packs (wife as carer was struggling to manage patient’s meds) and co-ordinated delivery (new prescription generated by GP surgery but not picked up by community pharmacy, meaning wife was continuing to struggle using previous supply of boxed medication).
 | 4 | 65-150 |
| 1. Patient not using tiotropium or salbutamol easibreathe and inhaler technique poor. Discussed with GP: stopped tiotropium for now and amended salbutamol to mdi plus spacer with mask. Patient shown how to use device and spacer and technique checked.
 | 4 | 65-150 |
| 1. Medicines stopped as no longer clinically indicated: Senna, Peppermint Oil, Lansoprazole, Gabapentin, Simvastatin, Adcal
 | 4 | 65-150 |
| 1. Ramipril 10mg in blister pack despite being stopped by hospital due to AKI. Spoke to GP - agreed stop and do BP & bloods. Patient told to omit ramipril. BP high, reported back to GP and amlodipine started. Follow-up BP monitoring co-ordinated
 | 5 | 713-1484 |
| 1. Patient unwell during visit - task sent to GP requesting home visit. GP attended same day and patient re-admitted. (Readmission likely to have happened anyway however occurred earlier with the intervention).
 | 4 | 65-150 |
| 1. Patient had Gabapentin increased to four times daily in hospital. Patient wanted to remain on three times daily – discussed with GP who adjusted.
 | 3 | 0-6 |
| 1. Type 2 diabetic patient non-compliant with insulin and other meds. Explained importance of insulin especially as now had toe amputated. Unfortunately adherence did not improve and patient subsequently had below knee amputation
 | 3 | 0-6 |
| 1. Counselled patient on the importance of cleaning nebuliser after each use to avoid build-up of bacteria and re-infection. Patient had not been informed on how to clean before visit.
 | 4 | 65-150 |
| 1. Assessed for blister packs. Arranged with community pharmacy to commence 2/7 after visit. Patient had previously been missing medication on some days, adherence improved with blister pack
 | 4 | 65-150 |
| 1. Bendroflumethiazide stopped by hospital due to poor renal function. Informed community pharmacy to omit from next month’s blister packs and supplied them with copy of discharge summary. Ensured patient was omitting bendroflumethiazide from current blisters. Community pharmacy had received no information from hospital and had been unaware of the change
 | 4 | 65-150 |
| 1. Change in inhalers from community respiratory prior to initial admission had not been actioned. (Seretide to change to Fostair and Eklira to Incruse as patient had not been taking.) Prescription requested. Additional visit 17/02/17 to deliver inhalers and counselled. Seretide removed.
 | 4 | 65-150 |
| **Total cost avoidance** |  | **£2401 - £5236** |
| **Mean cost avoidance per intervention** |  | **£120.05 - £261.80** |
| **Cost Avoidance per review (mean = 1.25 interventions per review)** |  | **£150.06 - £327.25** |

Medicines Adherence

All 16 visited by the VW-MMT answered the 3 medicines adherence questions at their initial visit (prior to review) and on at least one of the 2 follow-up telephone calls. Thirteen patients (81%) showed a decrease in score over the 3 assessments (representing an improvement in self-reported adherence). These results are displayed in Table 3.

**Table 3: Medication Adherence Scores Of Patients Receiving Post-discharge Medication Reviews from VW-MMT**

|  |  |  |  |
| --- | --- | --- | --- |
| Patient | Score at initial visit | Score at 5 week follow-up | Score at 13 week follow-up |
| 1 | 1 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 1 | 0 | 0 |
| 4 | 2 | 1 | 0 |
| 5 | 1 | 1 | 0 |
| 6 | 1 | Unavailable | 0 |
| 7 | 1 | 0 | 0 |
| 8 | 2 | 1 | Unavailable |
| 9 | 1 | 0 | 0 |
| 10 | 1 | 0 | 0 |
| 11 | 2 | 1 | 0 |
| 12 | 0 | 0 | 0 |
| 13 | 1  | Unavailable | 0 |
| 14 | 1 | Unavailable | 1 |
| 15 | 1 | 0 | 0 |
| 16 | 1 | Unavailable | 0 |

Costs of Providing the Service

Hospital Pharmacy Time

Two Agenda for Change (AfC) band 7 pharmacists and one AfC band 5 pharmacy technician were responsible for identifying, consenting and referring patients from the hospital to the VW-MMT. This process took 30-45min per patient referred. The pharmacists spent more time than the technician on the project; precise split in terms of time and reasons for this were not supplied by the hospital. However for the purposes of this evaluation it was assumed that the division of labour was 2:1 with the pharmacists completing the greater proportion of the work.

In 2016-17 the cost of a band 7 pharmacist was £31.44 per hour and a band 5 technician cost £21.42 per hour (using values for staff at the top of each band). Therefore the estimated cost to the hospital of identifying, consenting and referring each patient was between £14 and £21.

VW-MMT Time

The VW-MMT spent approximately two hours per patient on medication review, nterventions and follow-up. This time was evenly spilt between the AfC band 7 pharmacist and band 5 technician. Using the costings above, the post-discharge review service cost the CCG approximately £53 per patient to deliver in terms of staff time.

The total estimated cost to the NHS of providing the service was therefore between £67 and £74 per patient. If each review saved £150 - £327 in terms of improved care as shown in Table 2 above, the net cost saving to the NHS can therefore be estimated to be between £76 and £260 per patient referred to and reviewed by the VW-MMT.

Drug Cost Savings

During the pilot an annualised total drug cost saving of £1301 for the 16 patients was realised by the VW-MMT. This saving was produced by stopping medicines no longer needed by the patient, and equates to an average cost saving of £81 per annum per patient reviewed.

Readmissions

Six of the 16 patients (37.5%) were readmitted to hospital at least once within 1 month of their initial medication review by the VW-MMT. Nine (56%) were readmitted at least once within 6 months.

**Discussion**

Referrals from the hospital to the CCG VW-MMT were slow at first, with only two referrals being made in the first two months. This is possibly due to the time needed to incorporate the patient identification and referral process into the routine work of the hospital pharmacy team. Feedback from the hospital pharmacists involved with the project was that it was necessary to ‘get into the habit’ of identifying patients, particularly as the pilot only included patients registered to GPs in one CCG locality. As well as reducing the pool of patients to recruit from, this presented an extra check required before a patient could be recruited, which would not have been necessary had the service been available to all patients.

Following the initial lag period however, referrals slowly increased, up to a peak of 8 referrals during the month of January. Given the restrictions in terms of locality in which the reviews could take place and the fact that only two wards were involved with the pilot, there is the potential for referrals to increase substantially were the service to be opened up to all wards and to all localities served by the hospital. Other restrictions on referral rate, based on the feedback of the hospital pharmacists, included ‘busy times’ for the hospital, when identifying patients ‘wasn’t at the forefront of our minds’, and the ‘long-winded’ referral process, which required ‘quite a bit of time’ (20-30 minutes per patient) to complete. It could be that making greater use of pharmacy technicians to identify and refer patients would improve the overall efficiency of the referral process. Streamlining the referral form to integrate it with the hospital’s electronic discharge system is another possible suggestion to reduce the burden on the hospital pharmacy staff, allowing more patients to be referred.

The most common reason for referral for a post-discharge domiciliary medication review in this pilot project were changes to medicines made in hospital which might need further explanation, followed by the need for another form of patient education, which could be provided by a pharmacist or pharmacy technician. In addition, almost half of referred patients were taking a medicine felt to be ‘high risk’ which might require extra monitoring and support. These factors are well in keeping with the ethos of the MUR service, which, since 2011, has included recently discharged patients as a target group [27]. However the numbers of post-discharge MURs (dMURs) conducted by community pharmacists has remained low. An online survey exploring the provision of dMURs in March 2013 in West Yorkshire found that although 76% of MURs conducted in the last month were targeted, less than 1% were dMURs [28]. Key barriers to provision were not receiving discharge medication summaries and restrictions on provisions to housebound patients.

This pilot project circumvented both these issues by being in its nature a domiciliary visit service, and by linking in directly with the pharmacy department at the local hospital. This is in line with both the 2009 CQC report on managing medicines after discharge and the 2012 DoH action plan on improving the use of medicines [13,14].

Again in keeping with the MUR model on which they were based, the most common interventions during domiciliary medication reviews were patient education surrounding their medicines, medical condition, self-management and lifestyle. Half of all patients reviewed received medicines optimisation, whereby their regimen was simplified without compromising clinical efficacy. Such interventions have the potential to improve adherence and also save money by reducing the total number of doses needing to be prescribed and taken.

In nearly a third of cases, the VW-MMT felt that they had prevented or intervened in a critical incident which could have caused substantial harm to the patient. Examples included a patient who, due to an error on their hospital discharge summary had been using two inhalers designed for once daily usage twice a day, a patient whose son was meant to be helping her manage her medicines who had been left on her own and as a result was omitting all medicines including apixaban and levothyroxine, and a patient who was still receiving aspirin from the GP despite this having been stopped in hospital due to warfarin being initiated.

However, the opinion of the VW-MMT of the significance of the interventions made is highly subjective. In order to reduce this bias a Delphi process was employed, utilising the judgments of independent ‘experts’ (defined here as professionals experienced or practising in the field under study) on a collective basis which were then collated and fed back to the participants until a consensus was formed. Using this process, three-quarters of the interventions made by the VW-MMT were judged to be significant and to result in an improvement in the standard of care for the patient, with a further 10% judged to be very significant and to have prevented a major organ failure or adverse reaction of similar importance. No interventions were felt to be detrimental to the patient.

Associating the collectively judged significance of the interventions with a monetary value using the ScHARR model and adjusting for drug cost savings and pharmacy staff time, the overall net benefit to the NHS was estimated at £157-£341 per review conducted. This represents approximately a 2 – 5 times return on investment.

It must be acknowledged that costs and savings set out above are only estimates. Other possible costs include extra work generated for other members of the multidisciplinary team, for example GPs and community pharmacists. However it is hoped that any initial increase in time input required for the reviewed patients would be regained later on as problems and patient needs had been addressed soon after discharge rather than being allowed to escalate.

As there was no comparison group of patients (who did not receive the intervention) with whom to compare readmission rates, it is not possible to analyse the effect of the intervention on readmissions. In 2012, the national 30-day readmission rate for adult patients was 12%, rising to 15% for those aged over 75 [29,30]. In addition, a recent service evaluation of the introduction of a Medicines Care Plan for ‘at-risk’ patients discharged from elderly care wards at a large English teaching hospital reported a 30 day readmission rate of 22% in a comparison group of patients who did not receive their intervention [31].

National 6 month readmission rates are not easily available, but 2 UK studies evaluating the effect of domiciliary medication reviews in elderly patients found 6-month readmission rates of 28% and 32% in their control groups [32,33].

The higher readmission rates in patients reviewed by the VW-MMT could be a reflection of the high risk nature of the patients recruited, such that it was not possible for a pharmaceutical intervention to prevent the readmission. Instead the value represented by the interventions of the VW-MMT may manifest in other ways, such as a reduced need for GP visits, reduction in side effects or increased clinical benefit from medicines below the threshold for requiring readmission, increased independence and reduced reliance on carers to aid in the management of medication.

These outcomes were not studied during this pilot service evaluation due to time and resource constraints. However the improvement in self-reported adherence following the input of the VW-MMT does go some way to suggest that appropriateness of medication use was increased, which may be considered a proxy measure for some of the above outcomes. Although self-reported adherence may overestimate actual adherence, the improvement in scores compared to baseline is encouraging in terms of patients experiencing fewer problems with understanding and use of medication, and missing doses.

The small number of patients in this pilot service evaluation means findings need to be interpreted with caution. It should also be noted that using a Delphi process to gain consensus as to the value of the interventions made is still based on subjective opinion rather than actual patient outcomes.

**Conclusions**

Despite the stated limitations, this pilot project has demonstrated that it is feasible to set up a small-scale referral service between hospital and primary care pharmacy.

From the results presented, it appears that post-discharge domiciliary medication reviews have the potential to improve clinical care of vulnerable patients, reduce drug costs and improve medicines adherence. The VW-MMT service may provide an important supplement to the community pharmacy MUR service, due to reported difficulties in providing MURs to housebound patients and in community pharmacists identifying which patients could benefit. The CCG VW-MMT also have the advantage of access to GP clinical records and an established working relationship with GP practices which may make appropriate interventions easier to make and to action. A fully integrated service between hospital, primary care and community pharmacy could see more mobile and less complex patients referred for a community pharmacy dMUR, while those who are housebound or have problems requiring read/write access to GP records are referred to the VW-MMT. However in order for this to become a reality, support for the hospital staff to make referrals more efficiently would be needed.

A further, larger project involving more patients and pharmacy staff, a comparison group, and accurate measurement of a wider range of outcomes would help to confirm the value of such a service to the NHS.

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