

## Bridging the gap between hospital and primary care: the pharmacist home visit

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**Abstract** Bridging the gap between hospital and primary care is important as transition from one healthcare setting to another increases the risk on drug-related problems and consequent readmissions. To reduce those risks, pharmacist interventions during and after hospitalization have been frequently studied, albeit with variable effects. Therefore, in this manuscript we propose a three phase approach to structurally address post-discharge drug-related problems. First, hospitals need to transfer up-to-date medication information to community pharmacists. Second, the key phase of this approach consists of adequate follow-up at the patients' home. Pharmacists need to apply their clinical and communication skills to identify and analyze drug-related problems. Finally, to prevent and solve identified drug related problems a close collaboration within the primary care setting between pharmacists and general practitioners is of utmost importance. It is expected that such an approach results in improved quality of care and improved patient safety.

**Keywords** Care transitions · Community pharmacists · Drug-related problems · Home visit

### Impact of findings on practice

- Deploying a patient-centered post-discharge intervention program is expected to improve quality of care and patient safety after care transitions.
- Close collaboration of community pharmacists with the hospital and general practitioners is crucial for a successful intervention.

### Background

Post-discharge adverse outcomes

Transitions from one healthcare setting to another increase the risk of medication errors. These errors can result in clinical relevant outcomes like adverse drug events (ADEs), increased hospital stay, early readmissions after discharge and use of other healthcare resources [1]. Although ADEs are generally the most invasive type of drug-related problems (DRPs), other DRPs also result in patient harm leading to unplanned hospital readmissions. For instance, the rehospitalization rate among patients with identified medication discrepancies is significantly higher than the rate among patients with no identified medication discrepancies [2]. Furthermore, an observational study showed that 38 % of the hospital readmissions were considered to be medication-related, and 61 % of these were preventable [3]. The prevalence of DRPs post-discharge varies largely, but it is unclear why DRPs appear on such a

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large scale post-discharge [4]. Nevertheless, some possible explanations were given such as the overall tendency to shorten hospital stays (impairing proper discharge preparation for patients) and inadequate communication of drug regimen changes between healthcare settings [4]. So, a hospital (re)admission appears to be an important contributor to DRPs due to the accompanying changes in medication at the transition from hospital to home and back.

#### Pharmacist interventions

The underlying causes of hospital discharge problems are complex and require extensive strategies to improve care transitions [5]. However, due to the likely link between DRPs and adverse clinical outcomes, pharmacists can be the preferred healthcare provider although studies investigating their interventions show variable effects [6, 7]. Most of these interventions focused on helping patients to understand their drug regimen, reducing adverse drug reactions and helping patients to adhere to their drug regimens. Although these interventions in itself are important, they may frequently have been of insufficient intensity or may have lacked coordination between pharmacists across healthcare settings. Moreover, DRPs frequently cause inconvenience to patients and may negatively affect long-term health outcomes, but most DRPs do not result in increased medical care utilization in the short run [8]. Finally, some of these interventions might be insufficient to have an impact on short term morbidity [9].

Thus, to address post-discharge DRPs in the most efficient way with the highest impact, evidence tends to focus on discharge planning combined with home-based follow-up strategies [4]. The importance of adequate follow-up across healthcare settings is further illustrated by the fact that 27 % of drug treatments withdrawn during hospitalization as a result of an adverse drug reaction, had been represcribed post-discharge [10]. Additionally, a high number of readmissions occur in the days to weeks following hospital discharge of which a substantial percentage is drug-related [3]. As a pharmacist intervention is probably only affecting those readmissions that are associated with inadequate management of patients' drug therapy, the influence of a pharmacist intervention might be strongest when it is performed shortly after discharge [3].

Therefore, in this manuscript we propose a strategy to address post-discharge DRPs more effectively. When patients are discharged from the hospital, three critical phases need to be covered. First, information regarding drug use has to be transferred to the community pharmacist. For instance, information on new drugs, drugs discontinued and changes in dosing regimens. Second, effectiveness, tolerability, acceptance and implementation of the new drug

regimen by the patient has to be monitored post-discharge. Finally, this may warrant adaptations of the new drug regimen, such as lower doses in case of emerging side effects or implementing multi-dose dispensing systems, in case patients experience difficulties with organising their medication (Fig. 1; Box 1).

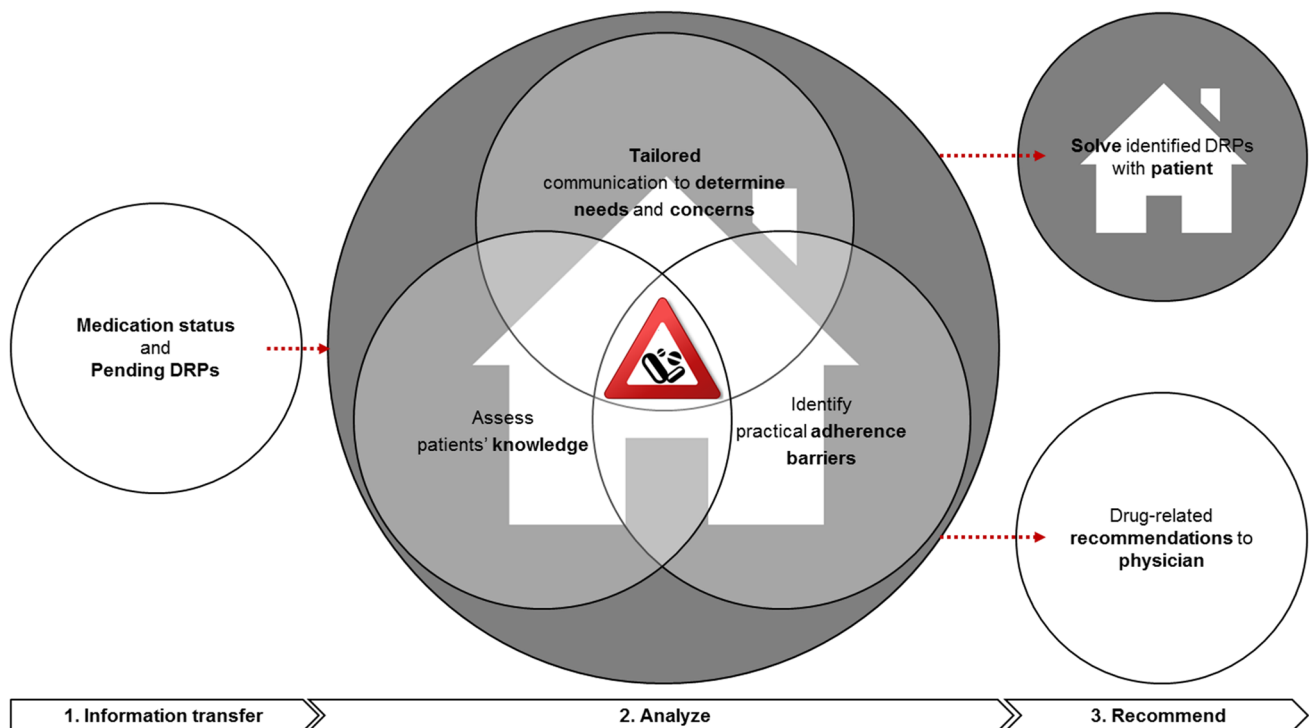
#### Phase 1: transfer of patient information

Most hospitals have a certain catchment area in which the majority of their patients live. For an effective continuity of a pharmaceutical care program, collaboration with community pharmacists in this area is essential. This is especially important since medication errors have been particularly attributed to poor communication or loss of information [11]. By facilitating transfer of complete and up to date information on medication use from hospitals to primary care, pharmacists can improve discharge processes [12]. Thus, it seems likely that DRPs, but also patients' medication knowledge and adherence, can be addressed most effectively by integrating healthcare settings. In this way, unsolved DRPs identified at various stages during the hospital stay can be transferred to the next stage, such as at patients' home. For example, at the time of hospital admission inadequate medication adherence may be suspected. Adherence counselling may subsequently be started during the hospitalisation. By informing the community pharmacist at discharge with their patient's non-adherence, adherence counselling may be continued post-discharge.

In order to achieve such a seamless care structure, at hospital discharge up-to-date medication information accompanied by pending DRPs should be communicated to community pharmacists. They are ideally positioned as a 'liaison officer' and adequate information transfer enables them to implement and monitor changes in the drug regimen. In turn, community pharmacists need to have a robust system in place to ensure this adequate follow-up [13]. Furthermore, 'embedding' them in the primary healthcare sector is crucial [6]. The familiarity of the community pharmacist with the patient's clinical history and social situation are possibly an advantage as compared to deploying research pharmacists [7]. Finally, the use of the patient's own community pharmacist may promote patient-pharmacist communication, which increases the possibility of patients reporting their drug-related issues.

#### Phase 2: analysing problems post-discharge

The patient (or his caregiver) has important information about his actual medicine use and use-associated problems because he is the only constant factor across healthcare



**Fig. 1** Schematic representation of the three phase approach to address drug-related problems post-discharge

#### **Box 1** Study characteristics for testing the described approach

The Home-based Community pharmacist-led Medication management (HomeCoMe) program is based on the three phase approach described in this manuscript. At the moment, this program is tested in the Netherlands in 150 recently discharged, adult patients. The identified DRPs and performed recommendations on resolving them, including the physicians' acceptance rate, will be monitored. Furthermore, pharmacists' communication skills and patient satisfaction with the HomeCoMe-program will be tested. Finally, attempts will be made to clarify specific patient characteristics to identify those patients who benefit most from this program

settings [14]. Evaluation of patients' medication post-discharge is necessary since patients could resume old and incorrect medication routines, new problems may arise (such as emerging ADEs and other DRPs after hospitalization) or because misunderstanding of the new regimen might occur. Although community pharmacists lack the extensive clinical skills of physicians, they do have more in-depth pharmacological knowledge that enables them to identify ADEs. A trigger list consisting of signs and symptoms indicative of potential ADEs may help pharmacists to identify these ADEs [15]. In order to further increase the effectiveness of pharmacists' counselling the following aspects should be considered: determining the patients' needs and concerns, assessing their knowledge and identifying possible adherence barriers.

#### Tailored communication to determine needs and concerns

Healthcare providers should tailor their communication in such way that it enables patients to express their beliefs and concerns regarding their medication [16]. This is especially important since patients' willingness to start and continue prescribed medication is influenced by how they judge their personal need for the treatment relative to their concerns about taking it [17]. These individual patient beliefs relate strongly with predictors of health behaviour including medication adherence [17]. Since hospital admission frequently results in medication changes including starting (additional) medication, a post-discharge follow-up can be an outstanding opportunity to assess individual needs and concerns.

#### Assess patients' knowledge

Hospital discharge is a stressful event at which patients can easily be overloaded with information [18]. Moreover, patients are probably confronted with difficult decisions and changes and might not yet be ready to take care of themselves. Therefore, it can be questioned whether providing information on medicine use at discharge has the right timing. At discharge patients may not be able to understand the discharge medication prescriptions or simply wish to go home as quickly as possible. Furthermore,

between 1 and 2 % of the hospital discharges are against medical advice [19] and probably even more are discharged during out of office hours [14]. Both patients groups could not be provided with the appropriate information at discharge implying the necessity for post-discharge follow-up. Finally, a follow-up allows for reiteration of important medication information with recall-promoting techniques which has shown to be effective in other settings [20].

#### Identify practical adherence barriers

Apart from perceptual barriers and inadequate knowledge, patients can also have practical barriers that impede adherence. A post-discharge follow-up visit can help to identify these barriers, for instance by:

- Identifying (practical) barriers for medicines intake, e.g. forgetfulness, organizational problems or practical issues such as difficulties with opening pill containers;
- Focussing on identifying discrepancies between discharge medication orders and patients' self-reported regimens, e.g. due to hospital formulary restrictions;
- Checking on spare and expired medication to ensure that out of date medication is disposed of, together with any that are no longer prescribed.

#### Home visit

Although costly and some patients might be reluctant to welcome their community pharmacist in the privacy of their own home, it has several advantages. First, after hospital discharge (some) patients may not be able to visit the community pharmacy due to physical constraints. Next, by incorporating the components described earlier in a home-based program, DRPs can be identified in the patient's own surrounding. This may elicit more and other DRPs since all medicines are available at home and specific risk factors, such as multiple storage locations, hoarding and inappropriate medication storage conditions, can possibly only be identified during home visits. Moreover, deploying home visits instead of a telephone follow-up is possibly more beneficial due to the personal touch of face-to-face encounters [21].

### Phase 3: drug-related recommendations

#### Solve drug-related problems with the patient

Patients might feel more comfortable at home and therefore are more likely to share their experiences and concerns about their medicines and even be more receptive to

pharmacist's counselling. Therefore, a community pharmacist home visit post-discharge is ideal to tailor (adherence) interventions to the individual patient. Nevertheless, pharmacists may have a tendency to offer patients advice, information and instruction and lose track of the patients' agenda [22]. However, by assessing patients' perceptions on their use of medicines in general and specifically for newly started medicines, pharmacists should force themselves to solely address the problems relevant to the patients. Hereby minimising the risk of resistance and rejection.

#### Recommendations to physician

Not all identified DRPs can be solved by pharmacist-patient interactions at the patient's home: some DRPs are in need of further investigation by a physician. The acceptance by physicians of drug-related recommendations will require more intense communication than solely faxing a document to the physician's office [23]. Direct contact and intensive collaboration between community pharmacists and physicians may improve uptake of the recommendations given by the pharmacist [24]. Thus a close working relationship with general practitioners by integrating the pharmacist in the primary healthcare setting is vital to improve adoption of pharmacist' recommendations.

### Conclusion

Causes of hospital readmissions are complex but community pharmacists are well-equipped to affect those readmissions that are associated with inadequate management of patients' drug therapy post-discharge. For optimal efficacy, they need to be fuelled by the hospital with up-to-date medication information before they can perform a patient-centred post-discharge follow up in primary care preferably through a home visit. Closely collaborating with general practitioners is expected to improve patient safety even further.

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