

# Patient safety and medication use after discharge: exploratory study<sup>1</sup>

## Segurança do paciente no uso de medicamentos após a alta hospitalar: estudo exploratório

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### Abstract

Few Brazilian studies have focused on patient safety strategies for safe use of medications after discharge leading to limited knowledge of current safety practices developed in Brazilian hospitals. The present study aimed to understand the dynamics and challenges of care provided to patients by hospital providers focusing on safe use of medications after discharge. An exploratory study was conducted and data was collected through interviews with physicians, nurses, pharmacists and social workers at the Hospital Universitário da Universidade de São Paulo, in São Paulo, southeastern Brazil. Care practices regarding medication use during and following hospital stay including access to medicines after discharge, follow-up plans for coordinated, ongoing care, and barriers were investigated. The main strategy for safe use of medications after hospital discharge is to provide structured counseling for patients and particularly for caregivers of pediatric patients. The care team works to ensure access to the medications prescribed at discharge in special situations. Medication reconciliation is being implemented and home visits are limited to patients in critical condition with mobility problems. The main barriers identified in the study were limited information technology and human resources. It was concluded that there are some patient safety strategies in place but they are limited in scope and do not ensure coordinated, ongoing care after discharge. These findings point to a need to strengthen efforts to overcome the barriers identified to improve patient safety at the interface of hospital, primary care and the home setting.

**Keywords:** Drugs; Medication Errors; Adverse Events; Hospital Discharge; Patient Safety; Public Health.

## Resumo

No Brasil, são escassos os estudos sobre estratégias para a segurança do paciente no processo de uso de medicamentos após a alta hospitalar, o que dificulta o conhecimento sobre a atuação de hospitais brasileiros nessa área. Neste artigo, buscou-se compreender a dinâmica e os desafios do cuidado fornecido ao paciente pela equipe hospitalar, visando à segurança no processo de uso de medicamentos após a alta hospitalar. Realizou-se pesquisa exploratória por meio de entrevistas com médicos, enfermeiros, farmacêuticos e assistentes sociais do Hospital Universitário da Universidade de São Paulo. Foram pesquisadas as atividades de cuidado com a farmacoterapia durante e após a hospitalização, incluindo o acesso a medicamentos após alta, a existência de articulação do hospital com outros serviços de saúde, e barreiras para desenvolver essas atividades. A principal estratégia adotada é a orientação de alta, realizada de forma estruturada, principalmente para cuidadores de pacientes pediátricos. Em situações específicas, ocorre mobilização da equipe para viabilização do acesso a medicamentos prescritos na alta. Reconciliação medicamentosa está em fase de implantação, e visita domiciliar é realizada apenas para pacientes críticos com problemas de locomoção. As principais barreiras identificadas foram insuficiência de recursos humanos e falta de tecnologias de informação. Conclui-se que são desenvolvidas algumas estratégias, porém com limitações e sem articulação adequada com outros serviços de saúde para a continuidade do cuidado. Isto sugere a necessidade de concentração de esforços para transpor as barreiras identificadas, contribuindo para a segurança do paciente na interface entre hospital, atenção básica e domicílio.

**Palavras-chave:** Medicamentos; Erros de Medicação; Eventos Adversos; Alta Hospitalar; Segurança do Paciente; Saúde Pública.

## Introduction

Patient safety and health care quality concerning medication use has been a cause for concern and studies on a global scale. The National Patient Safety Program - Programa Nacional de Segurança do Paciente (PNSP), recently established in Brazil (Brasil, 2013), has shown itself to be important in promoting safe practices in Brazilian health care services.

In care transition situations, such as hospital discharge, patients can be particularly vulnerable and the occurrence of adverse drug events can result in emergency department visits or hospital readmissions. Studies have shown that activities such as medication reconciliation, counselling patients and/or caregivers and home visits are strategies developed in hospitals to minimize the risks of adverse drug events after hospitalization, contributing to avoiding harm to the patient and unnecessary costs to the health care system (Naylor et al., 1999; Huang and Liang, 2005; Coleman et al., 2006; Schnipper et al., 2006; Mueller et al., 2012).

The Brazilian Patients' Rights Charter guarantees Brazilian citizens the right to receive complete information on their treatment; to training in self-care, aiming at autonomy; to access to continuity of care with home support, when appropriate, or to follow up by other health care services (Brasil, 2006). However, the wealth of studies conducted abroad contrasts with the lack of Brazilian literature concerning patient safety in the process of medication use after discharge, making it more difficult to know the Brazilian hospitals' performance in this highly relevant public health issue.

The aim of this study was to understand the dynamic and challenges of the patient's care provided by the hospital staff, looking at the safety of the process of medication use after discharge.

## Methodological procedures

This was an exploratory study conducted in the Hospital Universitário da Universidade de São Paulo (HU/USP), chosen as it develops recognized strategic post discharge patient safety activities concerning medication use. Moreover, the HU/USP is viewed as a reference service in the area and is an important training center for health care human

resources, with residency programs for physicians, pharmacists and multidisciplinary team. It is a mid-complexity hospital, with 236 beds, and a monthly average of 1,014 hospitalizations, 393 surgeries and 306 births.

Between July and October 2012, interviews were conducted with: four physicians representing pediatric, internal medicine and surgery wards, as well as the Home Care Program; three nurses, two of whom worked in pediatric and internal medicine wards, and another in patient safety activities in different hospital wards, member of the Brazilian Nursing and Patient Safety Network (REBRAENSP); three pharmacists, representing Risk Management, Pharmacy and the clinical pharmacists staff; and one social worker.

The hospital sectors and the professional categories interviewed were selected by the researchers, but the participants were recommended by the person responsible for following up this research in the institution, designated by each sector .

All of the interviews were conducted in the researched hospital, on a day, time and place defined by the interviewees, after reading and signing an informed consent form. All interviews were recorded. A script was used containing guiding questions along four pre-established lines for analyzing results: cares on pharmacotherapy during hospitalization; cares on pharmacotherapy after discharge; coordination with other health care services on care after discharge; and facilitators and barriers.

In line with Resolution 196 of the National Health Council in 1996, the research was approved by the Research Ethics Committee.

## Results and discussion

### Care taken with pharmacotherapy during hospitalization

#### Previous medication use

In the HU/USP, the interview to obtain the patient's medication history on admission routinely has two

sources, the nurse and the internist or resident physician, supervised by the attending physician. In certain cases, the medication history is also collected from the patient or caregiver by the clinical pharmacist, if there is a need for more complete information, as part of the routine procedure for pharmacotherapy follow up. The medication histories collected are independent of each other and recorded in different places in the patient's medical records.

Conducting parallel, non-integrated interviews is uncomfortable for the patient, as they have to repeat the same information to various professionals and it can result in divergences between the information obtained by different sources. According to Etchells (2010), the staff should contribute to - and work from - a single, accurate medication list, eliminating doubts created due to divergences between lists obtained by different professionals. Moreover, the list of medications used prior to admission should be placed in a clearly visible location in order to facilitate comparison with subsequent prescriptions. Such recommendations are essential for medication reconciliation<sup>2</sup>, since this procedure comprises detailed analysis of each prescribed medicine on admission and on discharge, after comparison with the list of medications used up to the time of admission. An action (continue, interrupt or alter) should be recorded for each medication, as well as reasons for the decision made, to support later prescriptions (Kripalani et al., 2007a; Cua and Kripalani, 2008).

At the time the research was conducted, resident pharmacists were beginning to systematically collect medication histories in interviews, due to the establishment of medication reconciliation on hospital admission in the surgical ward. According to Moriel et al. (2008), patients of surgical services could be prioritized as, in these cases, the health care team is not familiar with the drugs usually taken by the patients, which are more related to the comorbidities than the reason for the hospitalization.

It is worth noting that establishing medication reconciliation is incipient in Brazilian hospitals,

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<sup>2</sup> "Medication reconciliation is the comprehensive evaluation of a patient's medication regimen any time there is a change in therapy in an effort to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions, as well as to observe compliance and adherence patterns. This process should include a comparison of the existing and previous medication regimens and should occur at every transition of care in which new medications are ordered, existing orders are rewritten or adjusted, or if the patient has added non-prescription medications to their self-care." (Chen and Burns, 2007, p. 4).

although it has been conducted in North American hospitals since 2001 (Gebhart, 2005) and has formed part of the standards for health care service accreditation in Canada and the USA since 2005 (ISMP, 2006; APhA - ASHP, 2012).

### **Setting the time of discharge**

In the HU/USP, programmed discharge only takes place in complex situations, especially in the pediatric ward, generally involving patients with long-term stays in hospitals, significant social issues or complex treatment. In these cases, the discharge is planned in a weekly multi-professional meeting, in which issues such as location of follow up, resources available in the community and access to the necessary medications, among others, are discussed, enabling the whole team to be involved in activities related to the hospital discharge.

In the majority of hospitalization cases in the HU/USP, however, discharge is decided on the day, during the multi-disciplinary visit to the wards. Various clinical visits take place simultaneously, in one single ward, making it unviable to attend the visits to all patients on the ward every day. Due to this dynamic, together with breakdowns in communication, nurses, pharmacists and other members of the team only find out about the discharge on the day on which the patient returns home.

Another Brazilian study (Pereira et al., 2007) describes a similar situation observed in habitual clinical practice in this country: lack of multidisciplinary participation in daily visits to the patient and informing the health care team of discharge only on the day on which it occurs, making interdisciplinary planning impossible and, therefore, making integrated multi-professional action to prepare the patient for returning home more difficult.

### **From daily prescription to discharge**

In the HU/USP, medication is prescribed daily by the intern or resident and assessed by the attending physician, nurses and clinical pharmacists. These various “filters” were mentioned by the interviewees as important safety barriers in avoiding harm to the patient, contributing to safety in the process of medication use. Indicators calculated by the pharmacy service show that interventions made by pharmacists are usually well accepted by

the hospital staff, and all physicians interviewed emphasized the importance of the prescription triage undertaken daily on the wards by the clinical pharmacists. However, this triple filtering does not take place for prescriptions on discharge, as the discharge prescription is not generally forwarded to the pharmacist to check, with the exception of cases in which the patient/caregiver receives discharge counseling from that professional, usually in pediatric units.

Cases were cited in which patients or family members eventually returned to the hospital as they were unable to acquire the medication due to prescription-related problems, such as abbreviations in the medications’ name, products unavailable in Primary Health Care Units (PHCU) or in community pharmacies and the use of inappropriate forms for psychotropic drugs, and lack of a doctor’s stamp. Moreover, it was reported, especially in pediatric units, that pharmacists frequently intercept prescriptions of compounding medications, due to lack of data such as drug concentration, dosage form and duration of treatment.

Studies conducted in various Brazilian states (Aguiar et al., 2006; Silva et al., 2007; Miasso et al., 2009; Rosa et al., 2009), involving seven hospitals show that incomplete prescriptions are frequent, as is the use of abbreviations and illegible prescriptions.

It is recommended that information technology be used so as to avoid errors in prescriptions, especially electronic prescribing with clinical decision support permitting standardization of the nomenclature of medications, reducing abbreviation use and issuing automatic alerts about inappropriate dosage, drug interactions and previous allergies (Wachter, 2010). This important tool, however, is not the reality in the HU/USP, or in the majority of Brazilian hospitals, usually due to limited financial resources.

Using IT to produce typed prescriptions is a more accessible strategy as well as useful in avoiding illegible handwritten prescriptions. However, in the HU/USP, although prescriptions were typed during hospitalization, it is still the exception, rather than the rule, on discharge.

### **Patient and/or caregiver counseling**

In the HU/USP, when the discharge is not programmed, as in the majority of cases, in addition

to the punctual orientation provided by physicians, discharge counseling on prescribed treatment is usually provided by the nurses, in the afternoon, immediately before the patient leaves the hospital. Other studies in Brazil show that, in usual clinical practice, discharge counseling, including medication use, is limited to the instructions given, in most cases by the physician and/or nurse on leaving the hospital, in a quick, superficial way, without taking into consideration individual needs and without verifying whether the patient has understood the instructions (Miasso and Cassiani, 2005; Pereira et al., 2007; Pompeo et al., 2007).

In the HU/USP, detailed counseling on treatment only occurs in cases of programmed discharge for pediatric patients, and only in exceptional cases with adults. In more complex cases, especially in pediatric units, the clinical pharmacist provides counseling to the caregiver, providing detailed information on various aspects related to the treatment, as well as practical training for correctly administering the prescribed medicine.

After the training or more detailed counseling, the caregiver or patient is requested to repeat the instructions received or demonstrate the technique learned, enabling learning to be assessed. Asking the patient to repeat back what he understands from the discharge instructions or demonstrate the new technique learned (“Teach-back”) is the best way of confirming understanding of the orientation received and is considered one of the most effective means of improving patient safety (Kripalani et al., 2007a).

At the end of discharge counseling provided by the HU/USP pharmacist, the caregiver receives printed material, containing specific information on the medication, such as special care to be taken in administering or storing the medication, as well as personalized worksheets to facilitate understanding of the posology. According to Fox et al. (2007), isolated use of the printed data or educational sessions does not improve patient adherence to treatment, but may be useful if educational material is provided in combination with direct orientation or other behavioral interventions.

In the HU/USP daily routine, counseling provided did not generally include information on potential

adverse effects of the prescribed medicine. Patients and caregivers receive general advice to return to the HU/USP itself or to the PHCU where they were being followed up if necessary, including if there is suspicion of some harm related to the pharmacological treatment.

Studies show that between 20% and 60% of patients reported having received information and being aware of possible side effects of their medications (Foster et al., 2005; Kerzman et al., 2005; Donihi et al., 2008). However, in a study on what patients want to know about their medication, the need for information on risks and side effects was mentioned by all study groups, often being the first item mentioned (Nair et al., 2002).

In the HU/USP routine, discharge counseling is not provided with emphasis on changes to the pharmacotherapeutic regime resulting from the medication reconciliation, such as inclusion or exclusion of medication or changes to doses in the patient’s pre-hospitalization treatment, as recommended by Cua and Kripalani (2008), as medication reconciliation on discharge has not yet been implemented.

Although there are recommendations on providing detailed counseling to patients and families on medicine use throughout the hospitalization (Greenwald et al., 2007), in the HU/USP orientation sessions do not take place during hospitalization.

### **At the time of discharge**

In some interviews, the HU/USP discharge summary was mentioned as an obligatory document the patient could use as a doctor’s note. It is worth pointing out the need for the health care staff to value the discharge summary as a communication instrument between health care services. For Klück and Guimarães (1999), when the patient receives a copy of the document with instructions to take it with them to future health care consultations, enabling the patient to become an agent of the process, guaranteeing better health care continuity and fewer risks to the patient.

In general, the HU/USP discharge summary only records the medications and their respective posology, included on the patient’s discharge prescription. However, in some cases, even this information is incompletely recorded, with medication, dose or duration of treatment not included.

Recording alterations to the treatment and justifications thereof on the HU/USP discharge summary only occurs in specific situations in which there is a need for alteration due to lack of response to the treatment during hospitalization. Such records are not the result of routine, systematic comparison between the discharge prescription and the list of medication used before hospitalization (obtained during the admission interview), as the medication reconciliation has not yet been implemented as routine upon discharge.

In addition to name, dose, frequency and route of administration, planned duration of treatment and reason for prescribing each medicine, Kripalani et al. (2007b) and Cua and Kripalani (2008) recommend that the discharge summary explain the reasons for including new medications and for alterations to previous treatment, irrespective of how obvious they may appear, as well as information on monitoring the treatment (which tests, how frequently and what is expected of monitoring procedures).

In a systematic literature review, Kripalani et al. (2007b) show that breakdowns in communication and in the transfer of information are common on discharge from hospital, with important information frequently missing from the discharge summary, such as medications prescribed on discharge (2% to 40%) and follow up plans (2% to 43%).

In a study involving 1,245 episodes of outpatient care with post-discharge patients, Grimes et al. (2011) found that in 50.1% of cases there was at least one prescribing error or lack of documenting or communicating treatment alterations, either in the discharge prescription or discharge summary.

Corry et al. (2000) found that the information on hospital letters sent to primary care are insufficient to adequately monitor the pharmacotherapy.

In the HU/USP, at the time of discharge, it is not routine to provide the patient or caregiver with a phone number and the name of who to call for clearing up doubts or specific orientation after returning home. According to the health care professionals interviewed, there is no structure in place for this type of care. Although this was recommended by Romano (1982) more than 30 years ago, it is not current practice in Brazilian hospitals.

In a study of discharged patients in Brazil, Pom-

peo et al. (2007) also found that there is no easy way to contact the hospital team to clear up doubts after returning home.

### **Access to medication prescribed upon discharge**

At time of discharge, the HU/USP does not provide the medication to be used upon returning home as there is no outpatient pharmacy at that institution. This study showed that accessing the medication prescribed upon discharge was a frequent concern and various strategies involving a multidisciplinary team were described to make continuity of treatment more viable, such as: adapting the prescription to primary health care medication list; contact with the public health care network to confirm the availability of medications; arrange the injectable medication administration in the HU/USP day hospital, in a Primary Health Care Unit (PHCU) or Family Health Care Unit (FHCU) if necessary after discharge; guidance and making documents viable guaranteeing access to free SUS-distributed medication; acquire compounded medications for pediatric patients, depending on an evaluation of the family's socio-economic conditions.

Such hospital team involvement is justified by the risk of problems accessing medication leading to delays in beginning prescribed treatment or interruptions in treatment that had begun during hospitalization. In a study conducted with 184 users of ten Health Care Units in the municipality of São Paulo, only half of those interviewed reported that the service always had all the medications they needed (Sala et al., 2011).

Other studies conducted in Brazil also approached problems with access to medication due to patients' economic difficulties or irregularities in the availability of medications in the public health care network (Arrais et al., 2005; Paniz et al., 2008; Perini, 2009; Luz et al., 2009, Santa-Helena et al., 2010; Ávila et al., 2011).

### **Care taken with pharmacotherapy post hospital discharge**

In the hospital studied, follow up through post-hospitalization home visits only occurred for patients attended by the HU/USP Home Care Program (PAD-HU/USP). The program, run by the hospital since 2000, is aimed at those patients discharged after

hospitalization in the HU/USP and who are not in a clinical condition to travel to hospital or who have locomotion problems. In general, they are elderly bedridden patients, with tracheostomy, gastrostomy, severe pressure ulcers, using tubes, or other critical conditions.

The discharge prescription is usually verified on the first PAD-HU/USP home visit and the patient is requested to show all medication being used. A commonly observed problem is storing medication inappropriately, in bathroom cabinets, mixed together with other family medicine, and out of date. Large stocks of previously suspended medications, dispensed for free by the public health network, are also often found.

Schenkel et al. (2005) also found inappropriate medication storage in a study conducted in residences in southern Brazil, where the majority of medications found were not being used (55%) and were being stored in the kitchen (43%) or bathroom (14%), exposed to heat and humidity. Moreover, the expiry date was found for 83% of the medications and had expired in 16%.

During PAD-HU/USP home visits, the team frequently finds that patients and caregivers have questions about the need, or otherwise, to continue treatment they were undertaking before the hospitalization. The physician interviewed from that service estimated that around 50% of patients asked about that issue on the first post-discharge home visit.

In a study conducted in Brazil, Pompeo et al. (2007) verified that patients are leaving the hospital with doubts, mainly related to the discharge prescription, rehabilitation care and independence once at home.

In an interview with patients between 7 and 14 days after being discharged from hospital, Kerzman et al. (2005) found that 73% knew the motives for the new medications prescribed, of those, 80% reported the correct indication. Fewer than 25% of those interviewed knew anything about side effects, tests necessary to monitor the pharmacotherapy and necessary lifestyle alterations. Moreover, 60% of patients reported not having received any orientation regarding new treatments prescribed during the hospitalization.

Another common finding in PAD-HU/USP home visits is discrepancies between the discharge prescription and the medications that the patient is actually using at home, through including medications or interrupting their use on their own, leading to the need for immediate intervention by the team during the home visit.

Schnipper et al. (2006), in a follow up of 79 patients between three and five days after discharge, found that 12 patients were not using one of their medications prescribed on discharge, 11 took medication at a frequency or dose that differed from that prescribed, and two were using different medications from that prescribed, although from the same therapeutic class. Moreover, two patients suffered from side effects, 14 had difficulty accessing the prescribed medication and 9 had difficulty with medication costs.

In a study by Smith et al. (1997), in which 53 older adults received a home visit between seven and ten days post-discharge, it was found that, for 31 of the patients, there were alterations in the pharmacotherapy regime prescribed upon discharge from hospital. Intervention, after contacting the prescribing physician, enabled seven readmissions to be avoided.

According to the PAD-HU/USP physician, there is currently no systemized procedure for attending patients on medication use, and including a pharmacist in the program home visit (as occurred previously) would enable care focusing on medication use to be provided.

Follow up through telephone contact is not routine in the HU/USP, occurring only in cases of more stable patients attended by the PAD, monitored using telephone contacts and home visit every six months, as well as any telephone contact from pharmacists to follow up cases of adverse drug reactions.

In controlled clinical trials evaluating the impact of telephone contact from pharmacists two days after hospital discharge, telephone follow up was associated with increased patient satisfaction, resolution of medication-related problems, fewer return visits to the emergency department (10% versus 24%) and reduced hospital readmission (15% versus 25%), with a total saving of approximately 12 thousand dollars (Dudas et al., 2001).

A retrospective cohort study involving patients with health insurance discharged from hospital in 2008 showed that, for the 6,773 patients who received telephone contact, the probability of readmission within 30 days was 23.1% lower than in the comparison group (Harrison et al., 2011).

Greenwald et al. (2007) recommend telephone contact in the two or three days following discharge to reinforce the discharge plan and resolve problems.

### **Coordination between the hospital and other health care services in post-discharge care**

Problems related to referring patients to other, higher or lower complexity units, reported in the HU/USP interviews have also been described in other Brazilian studies (Simino et al., 2010; Marin et al., 2010; Perrechi and Ribeiro, 2009), showing the lack of integration between hospitals and primary care, as well as the recurring lack of available hospital beds.

In the majority of cases when a patient is referred by the HU/USP, there is no communication between the teams in the different health care services, except through the SUS referral form and the discharge summary emitted by the hospital. Any coordination of care occurs more through the initiative of the teams involved than through the existence of a structured, systematic process between health care services at different levels of complexity. Differences between PHCUs with regards receptivity to contact and agility in resolving the issues referred by the hospital teams when patients were discharged were frequently reported.

With regards coordination between the HU/USP pharmacy staff and those in other health care services, there are significant results concerning the establishment of partnerships to provide medication, aiming at continuity of post-discharge treatment.

In a systematic literature review, Kripalani et al. (2007b) found that direct communication between hospital and primary care teams is infrequent (3% to 20%). Kripalani et al. (2007a) recommend involving the primary care team in the process of planning the discharge so as to formulate a plan for cohesive follow up.

In a study conducted in a Brazilian university hospital, Bernardino et al. (2010) found that tele-

phone contact to transfer information to the team at the health care unit responsible for following up the patient after discharge gave them satisfaction, perceiving themselves as being better received by the health care unit.

However, this type of coordination is not common in Brazil. For Lavras (2011), “the SUS today is a fragmented system, making access more difficult, generating discontinuity in care and compromising the integrity of care provided” (p. 871). Also according to this author, this fragmentation manifests itself in various ways, including lack of coordination between health care services.

### **Facilitators and barriers**

In the HU/USP interviews, various aspects related to the hospital team were mentioned as facilitators, such as initiative, commitment, accountability and qualification.

Multi-professional actions, occurring in all wards, were valued in the interviews and, especially in pediatric units, the integration between the components of the multi-professional team was highlighted as a facilitator.

Other factors mentioned as facilitating establishing activities aimed at patient safety were administrative leadership supporting Risk Management, and prioritizing the issue of safe medication use in the institution by the team.

As regards coordination between the HU/USP and other health care services, it was pointed out that articulation is facilitated in PHCUs and FHCUs in which HU/USP residents have activities or students from health care courses do internships, and in PHCUs and FHCUs whose professionals work or worked in the HU/USP or were already part of HU/USP residence programs or internships.

Some difficulties in the current routine were pointed out as barriers to developing activities related to caring for discharged patients, such as: lack of communication from the medical team beforehand on which medications the patients should use after returning home; the dynamic of the discharge routine, generating an accumulation of discharges in the afternoon; and the lack of electronic medical records and electronic prescriptions, as this make it more difficult to optimize the time needed to ex-



ecute routine tasks and to share information about the patient's care, and committing to coordination between health care services.

The most commonly mentioned barrier and also the most difficult to transpose for implanting or extending activities, especially concerning home follow up, either through telephone contact or home visits, was the need to broaden health care professionals. On the other hand, the nurses recognized that planning discharge for all patients would enable the care routines during hospitalization to be reorganized, contributing to improving patient care on discharge.

As regards coordination between the hospital and other health care services, the most commonly mentioned barrier was lack of contact between staff, understanding that the isolation of each team in their service resulting in lack of knowledge of the structures, workflows, complexity and day-to-day difficulties, the reality of the other.

Barriers for implanting and developing activities related to patient discharge care were also pointed out in studies conducted in other countries (Griffith et al., 1998; Alibhai et al., 1999; ASHP, 2005; Spinewine et al., 2006; Pedersen et al., 2007; Barnsteiner, 2008), showing that this is a common problem. Among the barriers mentioned were: lack of support by administration leadership, inadequate staff (insufficient or no specific training), lack of a systematized program, lack of previous notification on the discharge plan, lack of time and the need to use IT in an integrated way.

It is worth noting that, while various intervention involving information technology has been used in different countries for developing patient safety strategies (Bates, 2000; Jack and Bickmore, 2010/2011), such resources are not available in the majority of Brazilian hospitals.

## Study Limitations

Some HU/USP wards did not participate in the study, although some of the professionals interviewed were those who supervised all the wards. Additional studies, including systematic observation of the practices developed in the institution and interviews with professionals working in wards that were not

covered in this study would give greater knowledge of the dynamic of the process analyzed and increasing information on the challenges the hospital team experiences.

## Conclusions

Based on the information provided by the health care team concerning post discharge patient safety, focusing on medication use, of the activities undertaken, the following stands out: patient and/or caregiver discharge counseling, conducted in a different way with selected cases, especially in pediatric units.

Medication reconciliation, in the implantation phase, and mobilizing the multidisciplinary team so as to make access to prescribed medication on discharge viable, in specific cases, completes the activities developed during the hospitalization, so as to contribute to patient safety after discharge.

Home visiting is an important strategy for post-discharge patient safety, but, in its current form, it occurs without pharmacist participation, and it is limited to patients in critical condition with mobility problems.

Coordination between the hospital and other health care services, with the focus on medication use is, in general, limited to making access to medications prescribed upon discharge viable, not covering initiatives to integrate the transference of complete, accurate information for treatment continuity, not for patient follow up.

Lack of human resources and information technology are perceived as the main barrier to implanting, developing and increasing activities considered as strategic for post-discharge patient safety. On the other hand, characteristics of the hospital team and administrative leadership support are considered facilitators in implanting and developing such strategies.

Whereas the lack of contact between teams is considered to be the main barrier to coordination between the hospital and other health care services, developing academic activities together with primary care facilitates establishing "bridges" between services, showing the potential for success of using this facilitator in post discharge patient care integration initiatives between teams.

The results show that patient safety in the post discharge medication use process is part of the HU/ USP agenda, with several strategies being developed by the hospital team, albeit with limitations and not properly articulated with other health care services for continuity of care. Thus, there could be a commitment to patient safety post-discharge, suggesting the need to concentrate efforts on overcoming the barriers identified, aiming to contribute to patient safety at the interface between hospital, primary care and the home setting.

## Authors' contribution

Marques contributed to conceiving the study, collecting and analyzing the data, bibliographic research and writing the article. Romano-Lieber contributed to conceiving the study, analyzing the data and writing and critically revising the article.

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