

## Medication Reconciliation During Discharge to Improve the Transitional Care in a Tertiary Care Hospital

Shilpa R<sup>1</sup>, Neena Priyamalar EM<sup>1</sup>, Mohamed Thayub<sup>2\*</sup>, Ramya M<sup>1</sup>, Daniel Sundar Singh<sup>1</sup> and Kotturathu Mammen Cherian<sup>2</sup>

<sup>1</sup>Department of Pharmacy Practice, C.L.Baid Metha College of Pharmacy, Chennai, Tamil Nadu, India

<sup>2</sup>Frontier Lifeline Hospital, Chennai, Tamil Nadu, India

Received: July 30, 2020; Revised August 18, 2020; Accepted August 20, 2020

### ABSTRACT

**Background:** 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, also to observe compliance and adherence patterns which is required to improve patient care and outcomes in care transitions. The objective of this study was to determine the medication discrepancies at discharge summaries in a tertiary care hospital.

**Methodology and Findings:** A retrospective cross-sectional study was carried out for the period of eight months [March – November 2019]. During the study period a total of 1,956 patients were discharged among which 1,224 discharge summaries were analyzed by the clinical pharmacist for discrepancies. The Data were abstracted using medication reconciliation form as tool. A total of 453 discrepancies were observed among which 417(91.44%) had at least one unintended discrepancy at the time of discharge and 36(7.94%) had more than one unintended discrepancy. The most common unintentional discrepancy was discrepant direction of use of medication 126 (27.81%), followed by discrepant frequency of medication 114 (25.16%), 93 (20.52%) were omission error, 90 (19.86%) were discrepant dose, 21(4.63%) were discrepant drug and 9 (1.98%) were commission error.

**Conclusion:** Medication discrepancies in hospital discharge summaries can be easily prevented by giving attention to the medication therapy and increased involvement of clinical pharmacists in the provision of pharmaceutical care, results in improved patient outcomes and an overall reduction in health care costs. Hence Pharmacist collaborating with other health care providers will further improve patient safety and the medication reconciliation process.

**Keywords:** Reconciliation, Medication discrepancy, Medication error, Pharmacist, Discharge

### INTRODUCTION

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 includes a comparison of the existing and previous medication regimens and occurs 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 his or her self-care.

The goal of medication reconciliation is to obtain and maintain accurate and complete medication information for a patient and use this information within and across the continuum of care to ensure safe and effective use of medication [1]. When there is a lack of consistency in

documenting medication histories and performing medication reconciliation, a variety of medication-related problems (MRPs) occur [2].

Medication discrepancies have a significant impact on patient outcomes and both The Joint Commission (TJC) and the American Society of Health-System Pharmacists

**Corresponding author:** Mohamed Thayub, Frontier Lifeline Hospital, R 30 C, Ambattur Industrial Estate Rd, Mogappair, Chennai, Tamil Nadu, India, Tel: 7845123115; E-mail: thayubpharmd@gmail.com

**Citation:** Shilpa R, Neena PEM, Thayub M, Ramya M, Singh DS et al. (2020) Medication Reconciliation During Discharge to Improve the Transitional Care in a Tertiary Care Hospital. J Pharm Health Sci Res, 1(1): 47-53.

**Copyright:** ©2020 Shilpa R, Neena PEM, Thayub M, Ramya M, Singh DS et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

(ASHP) have recognized the importance of medication reconciliation in preventing these discrepancies [3]. Approximately half of all hospital-related medication errors and 20% of all ADEs have been attributed to poor communication at the transitions and interfaces of care. These medication discrepancies have potential to cause patient harm (i.e., potential adverse drug events, or PADEs). ADEs associated with medication discrepancies can prolong hospital stays and, in the post-discharge period, may lead to emergency room visits, hospital readmissions, and utilization of other healthcare resources [4].

Each time a patient moves from one setting to another, clinicians should review previous medication orders alongside new orders and plans for care, and reconcile any differences. An appropriate medication regimen after hospital discharge is an essential component of safe and effective care following hospitalization. Yet, adverse drug events post-discharge is exceedingly common. One study estimated that 12.5% of patients suffered adverse drug events within 30 days of discharge, of which 62% were preventable. These preventable adverse events may be attributable to two primary factors: provider error and patient misunderstanding [5].

Medication reconciliation is a process proven to reduce errors occurring at these transition points but various factors contributing to the inadequacy of medication reconciliation, among which two key findings are complexity of the reconciliation process and lack of time in a busy clinical practice setting.

Pharmacists should be directly involved in the medication reconciliation process considering the distinct knowledge and skills they possess relating to medication therapy. The involvement of pharmacists in the discharge process may reduce adverse outcomes. The American Society of Health-System Pharmacists has a policy stating that pharmacists should be leading and coordinating the interdisciplinary development, implementation, maintenance, and monitoring of the effectiveness of the medication reconciliation process [6].

Beyond active participation in medication reconciliation activities, pharmacists have five fundamental functions in medication reconciliation: developing policies and procedures regarding medication reconciliation processes, implementing and continuously improving those processes, training and assuring the continuing competency of those involved in medication reconciliation, providing operational and therapeutic expertise in the development of information systems that support medication reconciliation, and advocating for medication reconciliation programs in the community [7].

Medication reconciliation performed by pharmacists has demonstrated reduction in the frequency and severity of hospital medication errors potentially resulting in patient

harm, improve patient safety and reduce costs associated with health resource utilization. Thus, in addition to reconciliation, patients should be educated on using medication safely and communicating medication information to their care providers [20].

## OBJECTIVE

The objective of this study was to determine the medication discrepancies at discharge summaries in a tertiary care hospital.

## METHODOLOGY

### Study design and duration

This research is a retrospective and cross-sectional study which was conducted for a period of 8 months from March to November 2019 in an inpatient setting of a tertiary care hospital in Chennai.

### Inclusion criteria

- Patients of both genders
- Included all age group of patients
- Patient admitted in Inpatient department
- Patient discharged only during pharmacist working hours.
- Patient with at least one regular prescription medication during or before hospitalization.

### Exclusion criteria

- Patient if they were transferred to another hospital or died during hospitalization.
- Patient discharged when the pharmacist is not available
- Outpatient department patients

## RESULTS

A total of 1,956 patients were discharged among which 1,224 discharge summaries were analyzed by the clinical pharmacist for discrepancies. The Data were abstracted using medication reconciliation form as tool among them a total of 453 discrepancies were observed by the pharmacist.

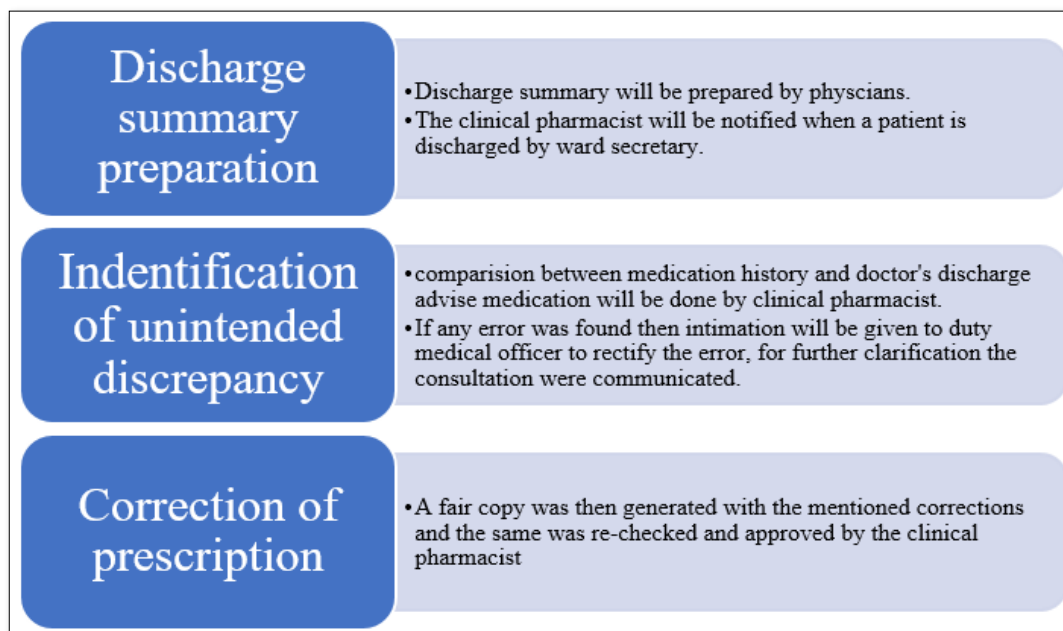
### Types of Discrepancy

Among 453 discrepancies the most common unintentional discrepancy was Discrepant direction of use of medication 126 (27.8%), followed by Discrepant frequency of medication 114 (25%), 93 (20.5%) were Omission, 90 (19.8%) Discrepant dose, 21 (4.63%) were Discrepant drug and 9 (1.98%) were Commission error, shown in **Table 1, Figure 2.**

### CLASSIFICATION OF DRUG DISCREPANCY

In our study among 453 discrepancy, majority of drugs belongs to Cardiovascular drugs 190 (41.94%), followed by Endocrine metabolic 122(26.93%), 97(21.4%) were

**STUDY PROCEDURE**



**Figure 1.** Study procedure.

**Table 1.** Types of discrepancy.

Types of discrepancy	Frequency	Percentage
Discrepant direction of use	126	27.8%
Discrepant frequency	114	25.1%
Omission	93	20.5%
Discrepant dose	90	19.8%
Discrepant drug	21	4.63%
Commission	9	1.98%

Gastrointestinal drugs, 23 (5.07%) were CNS drugs and others 21 (4.63%). shown in **Table 2, Figure 3.**

**NO OF UNINTENDED DISCREPENCY PER PRESCRIPTION**

In our study among 453 medication discrepancy majority 417(91.44%) had at least One unintended discrepancy at the time of discharge and 36(7.94%) had more than one unintended discrepancy shown in **Figure 4.**

**DISCUSSION**

The objective of the study was to evaluate medication discrepancy at hospital discharge. Discharge medication reconciliation requires multiple comparisons between different pieces of information, including medications on the best possible medication history (BPMH), medications

prescribed in the hospital (adjusted, new, discontinued), unchanged home medications, and medications to be started at discharge, which makes this process complex discharge. Further, cancelled or delayed discharges due to deterioration in a patient's condition necessitate that a previously dictated discharge summary be updated prior to the actual discharge. In such cases, great care should be exercised to update the discharge medication list. The result of this study demonstrated that the number of discrepancies per patient was 0.37. This number is smaller than other findings. This may be due to smaller number of medications at discharge [7]. Whereas in another study mean number of discharge medication discrepancies was 3.3 per patient [8]. Yet another study reported by **Jennifer et al** showed that 3.5 discrepancies per patient [9].

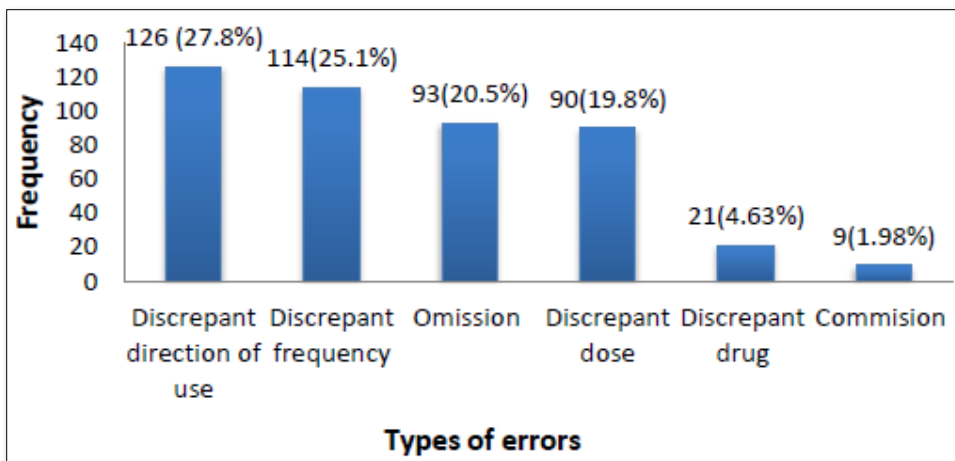


Figure 2. Types of discrepancy.

Table 2. Classification of drug discrepancy.

Drug class	Frequency	Percentage
Cardiovascular drug	190	41.94%
Endocrine drugs	122	26.93%
Gastrointestinal drugs	97	21.41%
CNS drugs	23	5.07%
Others	21	4.63%

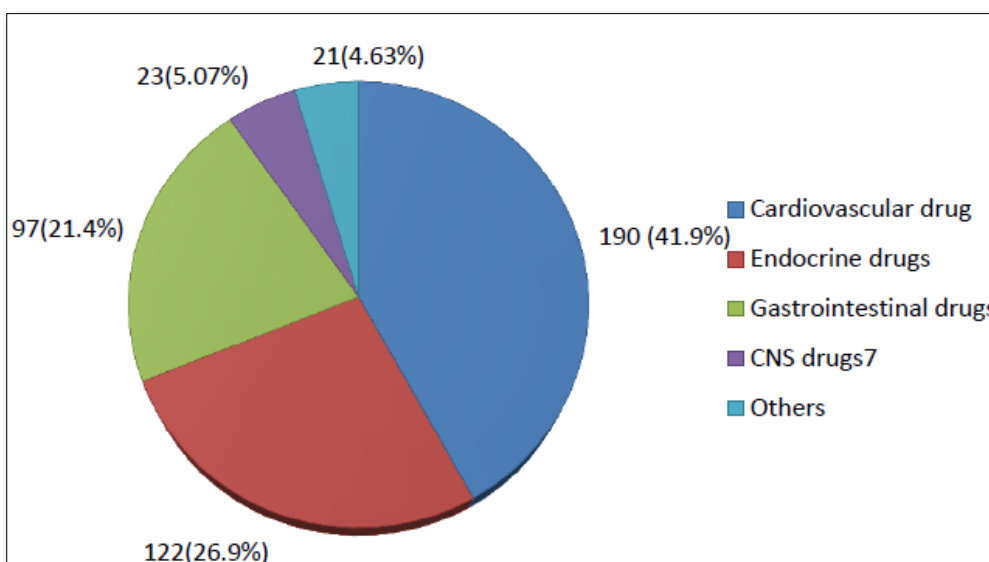
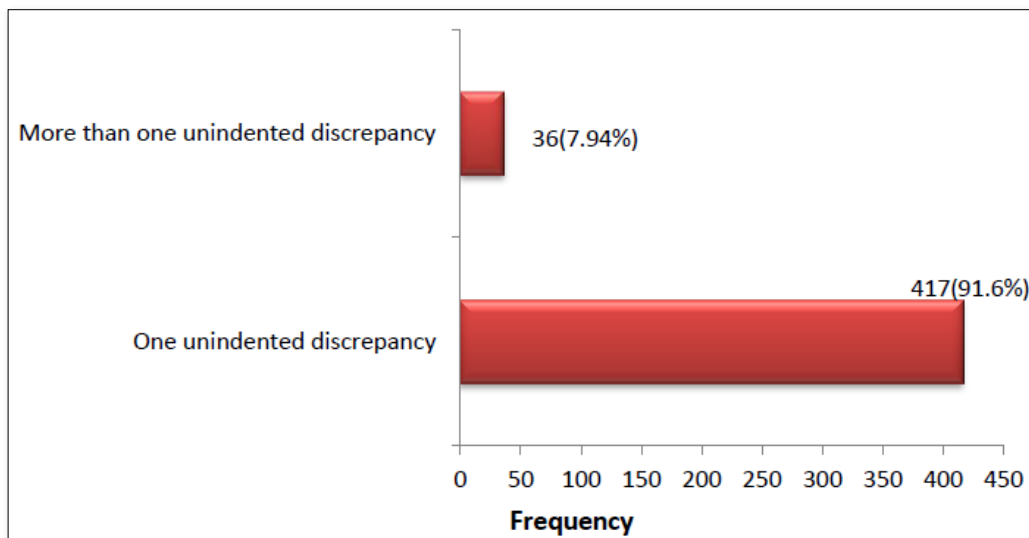


Figure 3. Classification of drug discrepancy.



**Figure 4.** No of unintended discrepancy per prescription.

Discrepancies in medication history may impair the effectiveness and safety of drug therapy. The most common discrepancies were direction of use of medication 126 (27.81%), followed by discrepant frequency of medication 114 (25.16%). This is in accordance with **Pippins JR et al., and Lombardi NF et al.**, [10]. In developed countries the healthcare professional can easily access the type of medication, dosing and frequency through the community pharmacy database. Whereas in our setting critical role played by pharmacists in the areas of medication safety and management has been left for the last many years. To overcome this Pharmacists should be well suited for performing medication related issues and their deep knowledge in pharmacokinetics, pharmacodynamics and drug formulation is valuable when conducting medication reviews, adjusting doses and IV to PO conversions [11].

The medication discrepancy may have little potential for patient harm when written at admission but much greater potential for harm when written at discharge because these discharge drugs are not under the control of health care provider. Hence, medication reconciliation during discharge can reduce potential harm to the patient, hospital readmission and reduce health care cost [12].

Furthermore, an increasing number of drugs was a significant risk factor for the presence as well as the number of medication discrepancies, as previously noted in many studies [13,14,15], not surprisingly given polypharmacy's strong association with adverse drug events and drug-related problems [16]. In our study out of 453 417 (91.44%) had at least one unintended discrepancy at the time of discharge and 36(7.94%) had more than one unintended discrepancy.

Our study demonstrated that cardiovascular drugs were the most frequent medications involved in discrepancy. This result was similar to the study conducted by **Van Sluisveld**

**N et al.**, [17]. Hence continuing medical education and updates should be given on cardiovascular drugs and disease [18-22].

Our finding showed that occurrence of discrepancy had no statistically significant association with the number of drugs at discharge, length of hospitalization and age of the patient. This may be due to small sample size [19, 23-26].

## CONCLUSION

Medication discrepancies in hospital discharge summaries can be easily prevented by giving attention to the medication therapy and increased involvement of clinical pharmacists in the provision of pharmaceutical care, results in improved patient outcomes and an overall reduction in health care costs. Understanding the type and frequency of discrepancies and group of patients at risk of medication discrepancy can empower clinicians to better understanding of ways to prevent them. Hence Pharmacist collaborating with other health care providers will further improve patient safety and the medication reconciliation process [27-30].

## REFERENCES

1. American Society of Health-System Pharmacists (2012) Improving care transitions: Optimizing medication reconciliation. *J Am Pharm Asso* 52: 1-20.
2. Barnsteiner JH (2005) Medication reconciliation: Transfer of medication information across settings: Keeping it free from error. *J Infus Nurs* 28(2 suppl): 31-36.
3. Newman D, Haight R, Hoefft D (2013) Implementation and impact of pharmacist led medication reconciliation and patient education at discharge from an inpatient behavioral health unit. *Mental Health Clinician* 3(1): 24-27.

4. Knez L, Suskovic S, Rezonja R, Laaksonen R, Mrhar A (2011) The need for medication reconciliation: a cross-sectional observational study in adult patients. *Respiratory medicine*. 105: S60-S66.
5. Ziaeeian B, Araujo KL, Ness PHV, Horwitz LI (2012) Medication reconciliation accuracy and patient understanding of intended medication changes on hospital discharge. *J Gen Intern Med* 27: 1513-1520.
6. Super TM, Phillips SW, Coffey RP, Patterson SA (2014) Impact of pharmacist facilitated discharge medication reconciliation. *Pharmacy* 2(3): 222-230.
7. Patel E, Pevnick JM, Kennelty KA (2019) Pharmacists and medication reconciliation: a review of recent literature. *Integr Pharm Res Pract* 8: 39-45.
8. Varkey P, Cunningham J, O'Meara J, Bonacci R, Desai N, et al. (2007) Multidisciplinary approach to inpatient medication reconciliation in an academic setting. *Am J Health Syst Pharm* 64: 850-854.
9. Pippins JR, Gandhi TK, Hamann C, Ndumele CD, Labonville SA, et al. (2008) Classifying and predicting errors of inpatient medication reconciliation. *J Gen Intern Med* 23: 1414-1422
10. Lombardi NF, Mendes AE, Lucchetta RC, Reis WC, Fávero ML, et al. (2016) Analysis of the discrepancies identified during medication reconciliation on patient admission in cardiology units: A descriptive study. *Rev Lat Am Enfermagem* 24: e2760.
11. Reeder TA, Mutnick A (2012) Clinical pharmacy services within a multiprofessional healthcare team. *Linnaeus University Dissertations* 84: 28-44.
12. Duguid M (2012) The importance of medication reconciliation for patients and practitioners. *Aust Prescr* 35(1): 15-19.
13. Grimes T, Delaney T, Duggan C, Kelly JG, Graham IM (2008) Survey of medication documentation at hospital discharge: Implications for patient safety and continuity of care. *Ir J Med Sci* 177(2): 93-97.
14. Cornu P, Steurbaut S, Leysen T, De Baere E, Ligneel C, et al. (2012) Discrepancies in medication information for the primary care physician and the geriatric patient at discharge. *Ann Pharmacother* 46(7-8): 983-90.
15. Geurts MM, Flier MVD, Bots AMDV, Wal TIBVD, Gier JJD (2013) Medication reconciliation to solve discrepancies in discharge documents after discharge from the hospital. *Int J Clin Pharm* 35(4): 600-607
16. Stitt DM, Elliott DP, Thompson SN (2011) Medication discrepancies identified at time of hospital discharge in a geriatric population. *Am J Geriatr Pharmacother* 9(4): 234-240.
17. Sluisveld NV, Zegers M, Natsch S, Wollersheim H (2012) Medication reconciliation at hospital admission and discharge: Insufficient knowledge, unclear task reallocation and lack of collaboration as major barriers to medication safety. *BMC Health Serv Res* 12: 170
18. Magalhães GF, Santos GN, Rosa MB, Lde AN (2014) Medication reconciliation in patients hospitalized in a cardiology unit. *PLoS One* 9: e115491
19. Shibeshi W (2015) Reconciliation of medication discrepancies at hospital discharge for inpatients in medical ward of St. Paul's Hospital Millennium Medical College, Addis Ababa, Ethiopia. *Ann Clin Lab Res* 3: 4.
20. Institute for Healthcare Improvement (2011) Prevent adverse drug events by implementing medication reconciliation. Available online at: <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventAdverseDrugEvents.aspx>
21. Unroe KT, Pfeifferberger T, Riegelhaupt S, Jastrzembski J, Lokhnygina Y, et al. (2010) Inpatient medication reconciliation at admission and discharge: A retrospective cohort study of age and other risk factors for medication discrepancies. *Am J Geriatr Pharmacother* 8(2): 115-126
22. Herrero JIH, Aparicio JG (2011) Medication discrepancies at discharge from an internal medicine service. *Eur J Intern Med* 22(1): 43-48.
23. Bandres MAA, Mendoza MA, Nicolas FG, Hernandez MAC, Iglesia FRL (2013) Pharmacist-led medication reconciliation to reduce discrepancies in transitions of care in Spain. *Int J Clin Pharm* 35: 1083-1090.
24. Cawthon C, Walia S, Osborn CY, Niesner KJ, Schnipper JL, Kripalani S (2012) Improving care transitions: The patient perspective. *J Health Commun* 17: 312-324.
25. Bates DW, Boyle DL, Vliet MBV, Schneider J, Leape L (1995) Relationship between medication errors and adverse drug events. *Gen Intern Med* 10: 199-205.
26. Frydenberg K, Brekke M (2012) Poor communication on patients' medication across health care levels leads to potentially harmful medication errors. *Scand J Primary Health Care* 30: 234-240.
27. Institution for Healthcare Improvement (2020) How-to-Guide: Prevent Adverse Drug Events by Implementing Medication Reconciliation. Available online at: <http://www.ihl.org/resources/Pages/Tools/HowtoGuidePreventAdverseDrugEvents.aspx>
28. Aspden P, Wolcott JA, Bootman JL, Cronenwett LR (2007) Committee on identifying and preventing medication errors. Preventing medication errors: Quality chasm series. Washington, DC: The National Academies Press.

29. Vira T, Colquhoun M, Etchells E (2006) Reconcilable differences: Correcting medication errors at hospital admission and discharge. *Qual Saf Health Care* 15: 122-126.
30. Jack BW, Chetty VK, Anthony D, Greenwald JL, Sanchez GM, Johnson AE, et al. (2009) A reengineered hospital discharge program to decrease rehospitalization: A randomized trial. *Ann Intern Med* 150: 178-187.