Review Article

Pharmacy led medicine reconciliation at hospital: A systematic review of effects and costs

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ABSTRACT

Keywords:
Medicine/medication reconciliation
Care transition errors
Costs
Hospital pharmacy
Pharmacy-led medicine reconciliation

Background: Transition of patients care between settings presents an increased opportunity for errors and preventable morbidity. A number of studies outlined that pharmacy-led medicine reconciliation (MR) might facilitate safer information transfer and medication use. MR practice is not well standardized and often delivered in combination with other health care activities. The question regarding the effects and costs of pharmacy-led MR and the optimum MR practice is warranted of value.
Objectives: To review the evidence for the effects and costs/cost-effectiveness of complete pharmacy-led MR in hospital settings.
Methods: A systematic review searching the following database was conducted up to the 13th December 2015; EMBASE & MEDLINE Ovid, CINAHL and the Cochrane library. Studies evaluating pharmacy-led MR performed fully from admission till discharges were included. Studies evaluated non-pharmacy-led MR at only one end of patient care or transfer was not included. Articles were screened and extracted independently by two investigators. Studies were divided into those in which: MR was the primary element of the intervention and labeled as "primarily MR" studies, or MR combined with non-MR care activities and labeled as "supplemented MR" studies. Quality assessment of studies was performed by independent reviewers using a pre-defined and validated tool.
Results: The literature search identified 4065 citations, of which 13 implemented complete MR. The lack of evidence precluded addressing the effects and costs of MR.
Conclusions: The composite of optimum MR practice is not widely standardized and requires discussion among health professions and key organizations. Research focused on evaluating cost-effectiveness of pharmacy-led MR is lacking.

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Introduction

Transition of patient care between settings presents an increased opportunity for error. Poor communication of clinical information at health care transitions is responsible for over 50% of all medication errors and up to 20% of adverse events.[1–4] At least half of discrepancies at discharge originate from discrepancies in medication histories, and 72% of all potentially harmful discrepancies in admission or discharge orders were due to errors related to compiling preadmission medicines list.[5,6] It is also estimated that 12% of adverse drug events upon hospital admission were related to medicine use and that each adverse event increase hospital stay by 8.5 days on average.[3,7]

Medicine reconciliation (MR) is proposed as a solution for communication deficits between health care settings.[2,8–10] In the US, the Joint Commission for health care organizations accreditation defines MR as the process of "obtaining and maintaining an accurate, detailed list of all medicines taken by a patient and using this list to provide correct medicines anywhere within the health care system."[10] In the UK, MR is described similarly and

recommended to be performed every time a transfer of care takes place.[11]

Studies have outlined that MR facilitates safer medication use after patient transfer of care.[12–18] Of note, two systematic reviews of hospital-based MR, Kwan et al,[17] and Mueller et al,[18] supported MR interventions that relied on pharmacists to improve the transfer of medication information. It was highlighted also that MR when bundled with other health care activities such as medication review and discharge planning might improve clinical and health care utilization post discharge.[17] However, the cost/cost-effectiveness of MR was not fully addressed, and MR was not always fully implemented. Thus, little was concluded whether the observed beneficial effects may justify costs and what would be the composites of optimized MR practice.

The Institute of Healthcare Improvement stated that occasionally MR is not fully implemented. For some organizations, MR is widely accepted as a medication history-taking task, and in others it includes only discharge reconciliation.[19] MR continues to be a challenge for many hospitals and care settings. This is due to the lack of clear ownership of MR and the need for developing a standardized approach to implement MR.[19] Thus, exploring the existing evidence to identify the features of MR practice and the resources necessary to deliver is warranted.

This systematic review aimed to synthesize evidence to determine the effects and costs associated with complete MR; in which MR is implemented at admission and continued through the hospital stay until discharge and where patient information is fully and accurately communicated to the next health provider. This would enable service purchasers and health policymakers to make more informed decisions regarding MR optimum practice and cost implications.

Methods

Identification of studies

PRISMA guidelines were used to inform this systematic review. A literature search was carried out from the start date of the database (noted in parentheses) to 13th December 2015. The following databases were reviewed; EMBASE (1946) & MEDLINE Ovid (1950), CINAHL (1961) and the Cochrane library including Cochrane Database of Systematic Review (1988), Database of Abstracts of Reviews of Effects and the NHS Economic Evaluation Database (1991), the Centre of Reviews and Dissemination and PHARMLINE provided by the National electronic Library for Medicines (1970).

Search terms were set by the authors prior to the beginning of the electronic search. Scoping searches reviewing published MR articles and citation searches using the SCOPUS database were conducted to identify all relevant search terms. Search terms were discussed with peer researchers with mixed professional and research backgrounds in an open forum. Search terms were revised accordingly. Bibliographies and reference lists of the identified studies and systematic reviews were revised to identify additional relevant articles. Authors and key institutions including the UK National Patient Safety Agency and National Prescribing Centre, Institute of Healthcare Improvement, the Agency of Healthcare research and Quality and Joint Commission in the US were contacted by email to obtain any relevant work. Search terms included: medicine/medication reconciliation, medical record review or assessment, drug history-taking, seamless care plus information communication and care transfer. Truncations (*), wild cards ($), hyphens and other relevant Boolean operators were used where permitted. The search strategy (Appendix 1) is available upon request. No restriction on language or publication date was applied.

Non-English studies were translated to English language by an independent researcher who speaks fluently in several languages.

Inclusion and exclusions criteria

Eligible studies were those evaluating adults and children receiving pharmacy-led MR within hospital inpatient settings. All types of admissions and ward specialties were considered. Only studies describing clearly that MR was implemented fully upon admission through the hospital stay until discharge and with patient information being communicated accurately to the next health provider were included. The term 'complete MR' was used for this review. Studies evaluating non-pharmacy-led MR at only one end of patient care or transfer were not included. Studies evaluating pharmacy-led MR using a qualitative approach and studies evaluating enhanced interventions, including telephone helpline and post discharge follow-up calls, were excluded. Telephone helpline and follow-up calls were not considered part of MR and suspected to influence readmissions and health care utilization.[20,21] Thus; these were excluded to avoid bias in favor of the intervention.

Study selection and data extraction

Screening of titles and abstracts for relevance and data extraction was performed independently by two authors; EH and AB. Discrepancies were discussed to obtain consensus, disagreement was resolved by a third author (DB).

Abstracted data were related to study design, authors, country of correspondence, year of publication and setting, study population, number of participants, demographics and baseline comparability if applicable. Details of the study intervention, including who and when implemented MR and what comprised the MR service, and the standard care in the study site, were extracted. Studies evaluating complete MR performed by pharmacy staff in a hospital setting were relevant to the review. Non-pharmacy-led MR was considered out of the scope of this review. Studies were divided into two subsets: those in which MR was the primary element of the intervention and labeled as "primarily MR" studies, and studies in which the MR intervention was performed in bundle with other non-MR health care activities. The latter were labeled as "supplemented MR" studies. This classification was to enable better understanding of the dynamic of MR practice and the true impact of MR on patient outcomes and health costs.

Outcomes and cost estimation

Details related to the effect of MR were recorded as process-oriented outcomes such as medication discrepancy rate, clinical significance of medication discrepancy and resources necessary to implement MR including time and training. Patient-oriented outcomes included health resource use in hospital and community, health related quality of life and mortality rate.

Costs related to the extra time commitment needed to implement MR and savings due to reductions in medicines taken during the hospital stay were extracted. Cost savings related to hospital and emergency department revisits, health resource use in community and the time of doctors and nurses freed from obtaining accurate medication histories, and transcribing medications changes were extracted.

High heterogeneity due to disparate study designs and measured of outcomes deemed meta-analytic data reporting inappropriate. However, where a common unit of outcome measure we reported the effect and/or costs was pooled. The central tendency and range/SD were estimated using Microsoft Excel