Medication reconciliation: Assessment of 4 years’ experience in a cardiology department
Céline Marie, Elisabeth Leclerc, Pauline Cavagna, Cécile Chung, Victoria Gauthier, Filomena Marques-Tavares, Christine Fernandez, Ariel Cohen, Marie Antignac

▶ To cite this version:
Céline Marie, Elisabeth Leclerc, Pauline Cavagna, Cécile Chung, Victoria Gauthier, et al.. Medication reconciliation: Assessment of 4 years’ experience in a cardiology department. Archives of cardiovascular diseases, 2022. 10.1016/j.acvd.2022.10.003 . hal-03953021

HAL Id: hal-03953021
https://hal.science/hal-03953021
Submitted on 23 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
Medication reconciliation: Assessment of 4 years’ experience in a cardiology department

Céline Mariea, Elisabeth Leclerca, Pauline Cavagnaa, Cécile Chunta, Victoria Gauthiera,
Filomena Marques-Tavareasa, Christine Fernandeza, Ariel Cohena, Marie Antignaca

a Department of Pharmacy, Saint-Antoine Hospital, Sorbonne University Hospital, AP–HP, 184, rue du Faubourg Saint-Antoine, 75012 Paris, France
b Department of Cardiology, University of Sorbonne, University Pierre & Marie Curie Paris 06, Saint-Antoine Hospital, AP–HP, 75012 Paris, France
c Sorbonne University, INSERM, Institut Pierre Louis d’Épidémiologie et de Santé Publique (Equipe PEPITES), AP–HP, Saint-Antoine Hospital, Department of Pharmacy, 75012 Paris, France
d Paris-Saclay University, Faculty of Pharmacy (Department of Clinical Pharmacy), 91400 Orsay, France
e Université Paris Cité, Inserm, PARCC, 75015 Paris, France

* Corresponding author at: Department of Pharmacy, Saint-Antoine Hospital, AP–HP, 184 rue du Faubourg Saint-Antoine, 75012 Paris, France.

E-mail address: celmarie.94@gmail.com (C. Marie).

Arch Cardiovasc Dis. 2022 Dec 5;S1875-2136(22)00224-8.
doi: 10.1016/j.acvd.2022.10.003

Tweet: Medication reconciliation, a good way to prevent and correct medication errors? In 2021, a Parisian study in Saint-Antoine Hospital showed that 7.4% of drugs were unintentionally prescribed by the physician, corrected in 60% of cases after the intervention of the pharmacist.
KEYWORDS

Medication reconciliation;
Cardiology department;
Unintentional medication discrepancy;
Clinical pharmacy

Abbreviations: ATC, Anatomical, Therapeutic and Chemical; BPMH, best possible medication history; ICU, intensive care unit; IMD, intentional medication discrepancy; UMD, unintentional medication discrepancy; WHO, World Health Organization.
In 2017 the World Health Organization (WHO) set up a global initiative to reduce serious preventable effects of medication errors by 50% in all countries over the subsequent 5 years.

Medication reconciliation is key to ensuring patient safety and reducing the risk of prescription error [1]. The aims of medication reconciliation are prevention and detection of prescription discrepancies at transition stages and at every step of medication management process. The WHO defines medication reconciliation as “a formal process in which healthcare professionals partner with patients to ensure accurate and complete medication information transfer at interfaces of care” [2].

The first step in medication reconciliation is to obtain the best possible medication history (BPMH), which is a review of all medications that the patient was taking before hospitalization. To obtain this information, three sources are required: the patient and/or family; medication packages; and medical records and/or the patient’s physicians or pharmacists. The second step consists of comparing the BPMH with the first hospital prescription. Then, medication discrepancies between the BPMH and the hospital prescription can be identified by pharmacists, and can lead to a pharmaceutical intervention to propose a modification of medication to prescribers. This intervention allows a collaborative discussion between pharmacists and physicians to classify the type of discrepancy as intentional or unintentional, and to correct the prescription, if necessary. The French National Authority for Health defines intentional medication discrepancies (IMDs) as voluntary deviation, documented or not documented in the patient record; whereas unintentional medication discrepancies (UMDs) are defined as involuntary, and are considered as medication errors. IMDs are physicians’ choices, i.e. there is a medical reason to modify the patient’s prescription. UMDs are medication errors, such as overdosing, underdosing or omission or substitution of the patient’s medication, and must be corrected.

Medication reconciliation was implemented in the cardiology department of Saint-Antoine Hospital in November 2017, after analysis of the CACTUS study [3], which identified patients’ prioritization criteria: eight or more prescribed medications; French not spoken; low educational level; admission to a hospitalization unit rather than an intensive care unit (ICU); and two or more co-morbidities.

To assess the benefit of medication reconciliation on the evolution of medication prescriptions, we performed quantitative and qualitative retrospective analyses of the medication reconciliation process in the cardiology department from November 2017 to June 2021. A trained pharmaceutical team, composed of pharmacy students and a pharmacy resident, performed medication reconciliation within
24 to 72 hours after admission. Collected covariates were sociodemographic characteristics (sex, age), hospitalization data (hospitalization unit or ICU) and reconciliation data (number of prescribed medications, type of discrepancies, number of pharmaceutical interventions and corrected number of UMDs). As mentioned previously, UMDs are considered to be medication errors that can lead to adverse events for the patient, and need to be corrected; therefore, this analysis focused on unintentional discrepancies.

Continuous data are expressed as means ± standard deviations, and categorical variables are expressed as numbers and percentages. A $P$ value < 0.001 was considered significant. A $\chi^2$ test of independence was used to compare adjusted corrected UMD rates, and a $\chi^2$ test of trend was used to study rate evolution, with R software (R Foundation for Statistical Computing, Vienna, Austria).

From November 2017 to June 2021, 6820 patients were hospitalized in the cardiology department. Following the prioritization criteria from the CACTUS study, 1164 patients were included in the medication reconciliation process, and 1361 medication reconciliations were realized: $n = 89$ in 2017 (2 months); $n = 669$ in 2018; $n = 367$ in 2019; $n = 156$ in 2020; and $n = 80$ in 2021 (6 months). Among them, 1291 (94.9%) were successful, defined as achievement of: review of the BPMH based at least on three sources; comparison with the first hospital prescription; and discussion between physicians and pharmacists to classify discrepancies and correct them, if necessary. There were 70 (5.1%) unsuccessful reconciliations because of: discharge before BPMH achievement; no known medication at admission; fewer than three sources available.

The mean age was 73 ± 15.0 years, 679/1164 (58.3%) were male and 73% of patients were admitted to a hospitalization unit rather than an ICU. The average length of hospitalization was 13.6 ± 7.5 days. Hospitalization was mainly related to circulatory system diseases (81.2%): ischaemic heart disease; cerebrovascular disease; cardiopulmonary circulation disease; or disease of the arteries or veins. Other reasons for hospitalization were: follow-up of medical device implantation or investigation after treatment for other diseases (9.4%); and abnormal results of clinical or biological investigations (5.4%).

A total of 10,283 prescribed medications were analysed in the reconciliation process, with a mean of 7.6 ± 4.2 medications/patient. Discrepancies were observed for 4803/10,283 (46.7%) prescribed medications. Of these, 4448 (92.6%) prescribed medications were flagged as IMDs, and 355 (7.4%) as UMDs. At least one UMD was identified for 191 (16.4%) patients, with 1–12 UMDs per patient. The
median number of UMDs per patient was 1.0 (interquartile range 1–2), with a mean of 1.8 ± 1.4 UMDs per patient. Among the 1291 successful medication reconciliations, we observed no UMDs for 1099 reconciliations (85.1%), one UMD for 100 (7.7%), two UMDs for 54 (4.2%), three UMDs for 25 (1.9%) and more than three UMDs for 13 (0.2%). After pharmaceutical intervention, 209/355 (58.9%) of UMDs were corrected. The corrected UMD rate was significantly different by year ($P < 0.001$), and increased significantly from 2017 to 2021 ($P < 0.001$; Fig. 1).

A successful medication reconciliation process was achieved for 18.9% of hospitalization stays in the cardiology department from 2017 to 2021. Almost half of the prescribed medications had at least one discrepancy, and 7.4% were flagged as UMDs.

The medication reconciliation process corrected almost 60% of UMDs as a result of pharmaceutical interventions. The corrected UMD rate increased with time, and reached 87% in 2020. This increase probably reflects an improvement in the relationship between cardiologists and pharmacists after years of collaboration.

Our work had some limitations. The study was performed in only two cardiology units (the hospital ward and the ICU) in the same hospital. Medication reconciliation could not be performed and achieved successfully for all patients. We observed that medication reconciliation inclusions varied from year to year; we also noticed decreases caused by a temporary lack of pharmacists or related to the COVID-19 pandemic. Patient care is influenced by the evolution of resources allocated to the clinical pharmacy. Because of the retrospective analysis, we were unable to collect some data, such as classification of medications involved in discrepancies. Cardiovascular treatments are the most likely to be involved in UMDs [4]. It would be pertinent to use the Anatomical, Therapeutic and Chemical (ATC) classification system, which classifies drugs according to organs and/or systems targeted by their therapeutic pharmacological effects. Using the ATC classification system could help to identify the types of medications and therapeutic indications that are concerned by UMDs, and also to grade UMD severity [5].

There were also strengths to this study. The medication reconciliation process is based on a standardized method described by French authorities, and set up after a feasibility study (CACTUS) [3], which allowed an important number of medication reconciliations.

In conclusion, the medication reconciliation process allowed the identification of a huge number of discrepancies in medication prescriptions, with 17% of patients concerned at cardiology department...
admission. Pharmacists have a major responsibility in preventing medication errors [6], and are an essential part of the cardiology care team. The multidisciplinary collaboration of health actors (city and hospital) is crucial for the proper conduct of medication reconciliation.
Disclosure of interest

The authors declare that they have no competing interest.

References


**Figure 1.** Evolution of successful reconciliations and corrected unintentional medication discrepancies (UMD) rates after pharmaceutical intervention, between 2017 and 2021.