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Performance of Medication Reconciliation for Internal Medicine Hospital Admissions – Before and After Educational Intervention

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Introduction

Medication reconciliation is the process of creating the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and comparing that list with the physician's admission, transfer, and/or discharge orders. The goal of medication reconciliation is to provide correct medications to the patients at all transition points within the hospital.¹ The rationale behind these is to prevent harm from medications, reducing medication errors or adverse drug events, and ensuring patient safety during transition of care, as it is recognized that 46% of medication errors occur during transitions of care.² Maintaining and communicating accurate patient medication information was included by The Joint Commission as one of the National Patient Safety Goals effective since January 2017.³

In this study, we sought to evaluate the practice and performance of medication reconciliation by medicine residents and/or nurses for Internal Medicine admissions to Westchester Medical Center, both at baseline and after an educational intervention.

Method

- We used a pre-post study design, to measure the occurrence of medication reconciliation before and again after an educational intervention directed to internal medicine residents.
- We collected the following information: who performed the medication reconciliation (in the special tab of electronic medical record), when it was performed, and whether the reconciled medication list was in agreement with the information in the admission history and physical examination (H&P) section of the electronic medical record (EMR) written by medicine admitting resident (MAR). The patients' EMR was observed within 48 hours after admission. If medication reconciliation was not done at admission, we also collected information of whether the reconciliation was done by the primary team within 24 hours or 48 hours of admission. This was the pre-intervention data collection.
- A total of 329 internal medicine admissions were selected for this study, of whom 127 consecutive hospital admissions in early September 2016 were used as baseline.
- The educational intervention was conducted in September and Early November with two approaches: (1) the proper way to do medication reconciliation was discussed and demonstrated during noon conference, which is usually attended by all floor and clinic residents and medical students; (2) written information about this was distributed via electronic-mail to all internal medicine residents.
- A second data collection was done immediately after the intervention (n=100) and a third data collection was done two months after the intervention (n=102), which served as the post-intervention data.
- Categorical variables were represented as counts and proportions (%) and statistical analysis was performed using the chi-square test. Results were reported as odds ratio (OR) with associated 95% confidence intervals (CI). All tests were two-sided and the statistical significance was defined as p < 0.05

Result

Table 1. Medication reconciliation performance pre-intervention, immediately post-intervention, and two months post-intervention

	Baseline	Immediately Post-intervention	OR (95% CI); p-value*	Two months post-intervention	OR (95% CI); p-value*
Medication reconciliation done by MAR on admission	20/127 (15.7%)	79/100 (79%)	20.12 (10.2 - 39.6); <0.0001	75/102 (73.5%)	14.86 (7.76-28.44); <0.0001
Medication reconciliation done by nurse on admission	62/127 (48.8%)	16/100 (16%)	0.19 (0.11-0.38); <0.0001	11/102 (10.8%)	0.12 (0.06-0.25); <0.0001
Medication reconciliation done within 24 hours of admission [#]	9/127 (7%)	2/100 (2%)	0.28 (0.05 -1.27); 0.12	5/102 (4.9%)	0.67 (0.22-2.08); 0.49
Medication reconciliation done within 48 hours of admission [#]	2/127 (1.5%)	1/100 (1%)	0.6 (0.05-7.06); 1	2/102 (1.9%)	1.25 (0.17-9.03); 1
No medication reconciliation done within 48 hours	34/127 (26.7%)	2/100 (2%)	0.05 (0.01-0.24); <0.0001	9/102 (8.8%)	0.26 (0.12-0.58); 0.0005
Concordance with the H&P medication list	55/127 (43%)	88/100 (88%)	9.6 (4.78-19.29); <0.0001	79/102 (77.4%)	4.49 (2.51-8.04); <0.0001
Medication reconciliations done by nurse, which showed discrepancies compared to H&P	33/66 (50%)	8/16 (50%)	2 (0.68-5.8); 0.19	10/15 (66.6%)	2 (0.61-6.28); 0.24

MAR = medicine admitting resident; H&P = history and physical examination section in electronic medical record
*p-value when compared to pre-intervention
total of medication reconciliation when it is not performed during admission time

Table 2. Comparison of medication reconciliation performance immediately post-intervention and two months post-intervention

	Immediately Post-intervention	2 months post-intervention (n= 102)	OR (95% CI); p-value
Medication reconciliation done by MAR on admission	79/100 (79%)	75/102 (73.5%)	0.73 (0.38 - 1.42); 0.36
Medication reconciliation done by nurse on admission	16/100 (16%)	11/102 (10.8%)	0.63 (0.28-1.44); 0.27
Medication reconciliation done within 24 hours of admission [#]	2/100 (2%)	5/102 (4.9%)	2.52 (0.48-13.33); 0.44
Medication reconciliation done within 48 hours of admission [#]	1/100 (1%)	2/102 (1.9%)	1.98 (0.18-22.18); 1
No medication reconciliation done within 48 hours	2/100 (2%)	9/102 (8.8%)	4.7 (0.99-22.52); 0.06
Concordance with the H&P medication list	88/100 (88%)	79/102 (77.4%)	0.46 (0.21-1.00); 0.04
Medication reconciliations done by nurse, which showed discrepancies compared to H&P	8/16 (50%)	10/15 (66.6%)	2 (0.46-8.55); 0.34

MAR = medicine admitting resident; H&P = history and physical examination section in electronic medical record
total of medication reconciliation when it is not performed during admission time

- Before intervention, 48.8% of medication reconciliation was done by nurse on admission, and 50% of the reconciled list had discrepancies with home medication section in H&P. MAR did only 15.7% of total medication reconciliation. (Table 1)
- After the educational intervention, a statistically significant improvement was seen on the overall medication reconciliation performance by the MAR on admission (15.7% vs 73.5%, p<0.0001), with a subsequent significant drop in the need for nurse to perform medication reconciliation (48.8% vs 10.8%, p<0.0001), and significantly lower proportion of patients who didn't have their medication reconciled within 48 hours (26.7% vs 8.8%, p=0.0005). In conjunction with that, we also noticed a significant improvement in agreement between the medication list and the information in the admission H&P section of the EMR. (Table 1)
- There was no significant difference between the number of medication reconciliations that were done within 24 and 48 hours of admission before and after intervention. (Table 1)
- There was no significant difference between MAR performance in reconciling home medication on admission 2 months after the intervention as compared to immediately post-intervention, although the concordance of reconciled medication with the list in the H&P was statistically worsened (88% vs 77.4%, p = 0.04) (Table 2). The number of patients who did not have their medication reconciled within 48 hours of admission was also increased (2% vs 8.8%, p=0.06), although not statistically significant.

Conclusions

- Before the educational intervention, 48.8% of medication reconciliations were done by the nurse on admission. When medication reconciliation was not done on admission by the MAR, around 50% were not in agreement with the home medication information in the H&P. Twenty-seven percent of patients did not have their medication reconciled within 48 hours of admission.
- After the educational intervention, a statistically significant improvement was seen in the performance of medication reconciliation by the medicine admitting resident; as evidenced by an increase in medication reconciliations done on admission, decrease in the need for nurses to perform medication reconciliation, and improved concordance between the medication reconciliation and the H&P medication list.
- However, there appears to be a need for further follow up education, as the overall performance was beginning to regress towards worsening compliance with performing medication reconciliation over time

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