

Reduction of medication errors in an intensive care unit (ICU)



ICHV

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 Intensive Care Unit

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Background and Objective :

Medication errors expose patients to serious harm and increase costs. Prescription and administration are critical steps of the medication process. This is not the case of transcription that is valueless. To suppress transcription, the medical order sheet and the nurse's administration plan were merged into a single document. This latter was pre printed and highly structured (*fig.1*) to encourage completeness of medical orders and to standardize the location of information. The aim of this study was to evaluate the impact of this intervention on the rate of clinically significant types of errors.

Results :

Data were collected during 85 days between April 2005 and June 2006. 9298 medications for 294 patients, corresponding to 754 patient days, were analyzed. No secular trend was observed (*fig.2*). Data were therefore consolidated into two data sets, PRE and POST. Error rate per medication decreased from 0.05 to 0.02 (-56.8%, $p < 0.001$)*. Patient days without any error raised from 59.3% to 79.8% (+35%, $p < 0.001$)* (*fig.3*). Impact on not discontinued administration errors was the highest (-98%, $p < 0.001$)* (*fig.4*).

*Fisher Exact test

Hour	Modifications	Time	Signal	Product	Dosage	Unit	Freq	Rate	Unit	TARGET	Route	R	Time	Signal	Dosage pres	Unit	Solution for dilution *	Final vol	Vol/hour	Round	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	Hydr. Contr.	
Start	Stop			AMIODARONE		mg		mg/24h									G ² □ G ₅ □ S ₅ □ N□	ml																												
Start	Stop			DOBUTAMINE		µg		µg/min		IV					250	mg	G ² □ G ₅ □ S ₅ □ N□	50 ml	ml/h	IV																										

Figure 1 – Extract of documents (prescription part [pink] and administration plan part [blue])

Design :

Prospective interventional interrupted time series study (ITS) (3 series before and 3 after the intervention) with a semi-direct observation method.

Setting :

ICU in a public hospital, 14 beds, 11 physicians, 45 nurses

Main outcome measures :

Error was defined as a clinically significant discrepancy between the prescription and the confirmation of the administration. Error rates were calculated per medication, per patient day and per type.

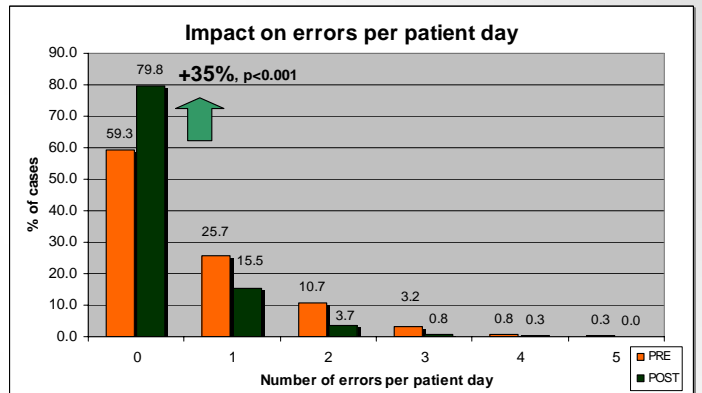


Figure 3 – Impact on clinically significant errors per patient day

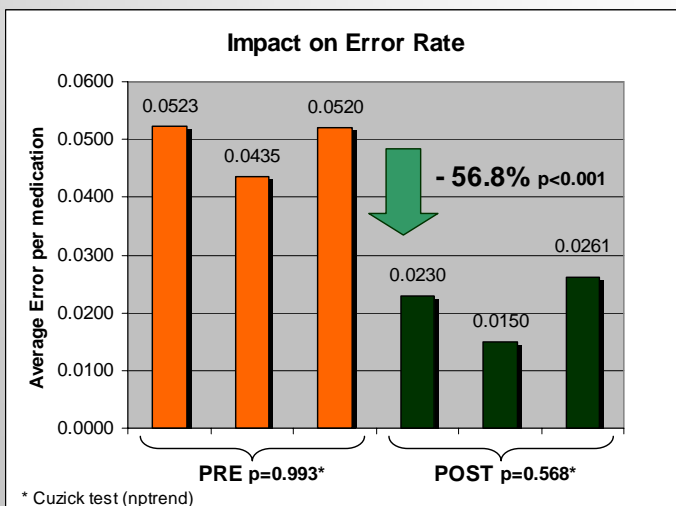


Figure 2 – Impact on clinically significant error rate

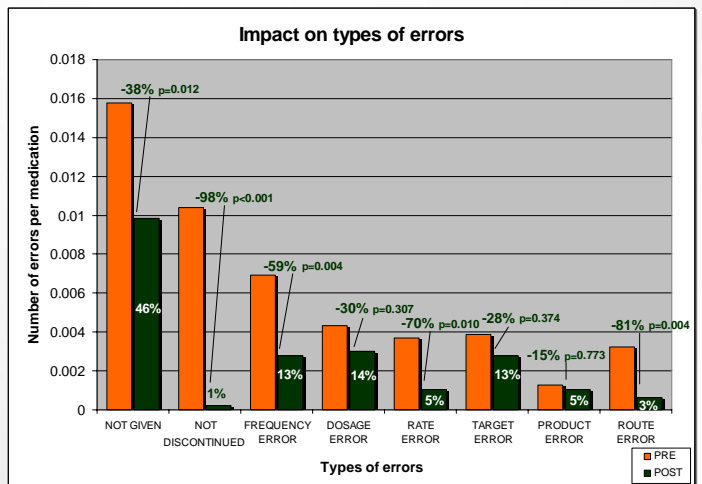


Figure 4 – Impact on clinically significant type of errors

Conclusions :

This multidisciplinary project improved the safety of the medication process in an ICU with a simple and inexpensive intervention. A follow-up, with regular data collection sessions, is planned and will be used as a quality indicator.