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Does a computerized physician order entry (CPOE) change clinical pharmacists' interventions? A controlled before-after study

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Background and Objective:

To identify and evaluate changes in clinical pharmacists' interventions after the introduction of CPOE.

Setting:

Internal medicine departments of two regional hospitals.

Design:

Controlled before-after. Both hospitals were disserved by the same clinical pharmacist.

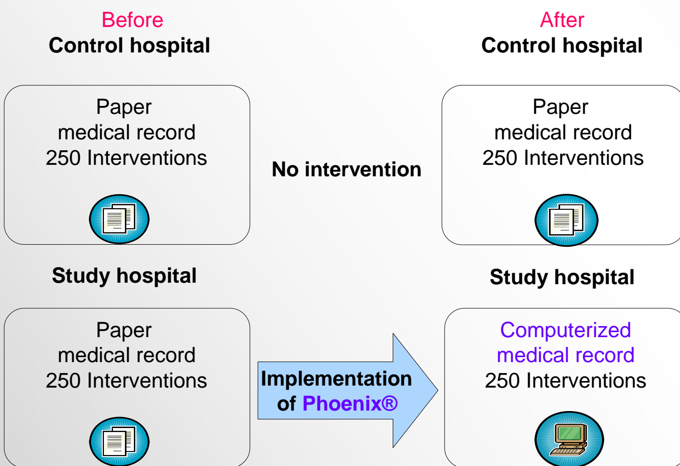

Figure 1: design of the controlled before-after study

Interventions were categorized in 13 items:

Categories	Examples
1.Indication	Discontinued PPI treatment (prescribed without any indication)
2.CI / SE	Discontinued metformin (due to renal impairment)
3.Dup. / Int.	Duplication: Discontinued misoprostol (patient already receiving a PPI) Interaction: Discontinued St Johns Wort (patient already receiving a SSRI)
4.Underuse	Initiation of a LMWH (due CVRF)
5.Dosage	Discontinued p.r.n acetaminophen (patient already receiving 1g every 6 h.)
6.Labeling	Prescription of Efexor® 75 mg 1-0-0-0 (venlafaxine) changed to Efexor® ER 75 mg 1-0-0-0
7.Rte of adm.	Crushed tablet of pantoprazole replaced with an adequate omeprazole galenic form
8.Lab.	Platelets count ordered (patient receiving HBPM)
9.Other error	Non formulary drug replaced with a formulary equivalent
10.Cost	Amoxiclav switch i.v -> oral
11.Precautions	Mouth rinse advised (Patient on inhaled corticoid)
12.Other interv.	Non available drug replaced with an adequate alternative
13.Non underst.	*Badly documented intervention*

Table 1: classification of the interventions

Main outcome measures:

Differences in the evolution of the frequency of interventions before and after the implementation of CPOE.

Results:

250 interventions before and 250 after the implementation of CPOE were analyzed in each hospital (total of 1000). CPOE allowed reducing incorrect labeling (e.g. name, dosage) by 10.8% and non respect of the drug formulary by 10%. Due to the design, other interventions increased (e.g. Indication:15% and Precautions: 12.2%).

As expected, the introduction of CPOE eliminates numerous basic problems inherent to manual order writing (e.g., illegible handwriting etc) and decreases the need of pharmacists' interventions related to this problem. In addition, if supported by an appropriate database e.g. proposing substitution, it decreases the need of pharmacist's interventions related to non formulary drug prescription.

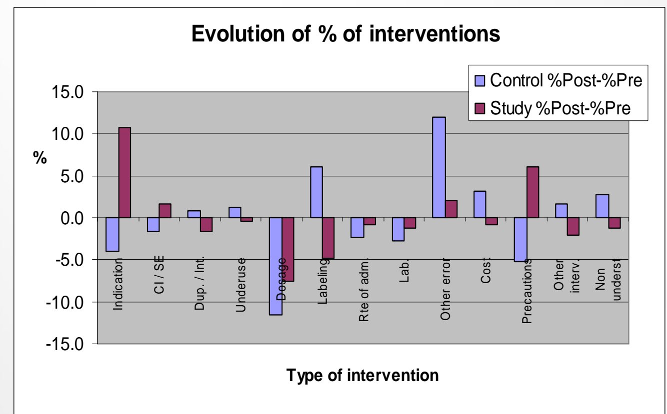

Figure 2: Evolution of % of interventions

Conclusions:

The introduction of a CPOE modified the profile of interventions completed by clinical pharmacists allowing more time for overall revision of drug treatment. These changes probably improve the efficiency of clinical pharmacists which should be evaluated in further studies. The use of a validated classification tool of the interventions could also allow inter-setting comparisons.

Available at http://www.ichv.ch/pha_poste.asp