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Reduce Medication Errors with Clinical Decision Support Systems

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Introduction

Now a day, medication error is one of the most problems among care processes by physicians. Medication error generally defined as a deviation from the physician's medication order as written on the patient's chart. In hospitals, medication errors occur at a rate of about one per patient per day [1]. Preventable adverse drug events are associated with one out of five injuries or deaths. Estimates reveal that 46% of medication errors occur on admission or discharge from a clinical unit/hospital when patient orders are written [2]. In general, the medication error rate was great among physicians with the least training, but no physician group was error free [3]. Background Medication errors are common, and while most such errors have little potential for harm they cause substantial extra work in hospitals. A small proportion does have the potential to cause injury, and some cause preventable adverse drug events [4]. Many medication errors can occur when ordering and dispensing medicine in hospitals. The clinical decision support system (CDSS) is widely used in an effort to reduce medication errors [5]. Clinical decision support systems (CDSSs) for antimicrobial stewardship require considerable human resources and financial investments [6]. A previous cohort study of 180 actual adverse drug events (ADEs) and 552 potential ADEs (PADEs) at six community hospitals in Massachusetts were analysed to determine the frequency and types of multiple-drug ADEs and the extent to which the ADEs might have been prevented using publicly available clinical decision-support (CDS) knowledge bases. None of the hospitals had a computerized prescriber-order-entry system at the time of data collection (January 2005–August 2006) showed that a total of 17 adverse drug events (ADEs) (rate, 1.4 per 100 admissions) and 146 PADEs (rate, 12.2 per 100 admissions) involving multiple drugs were identified. The documented events were related to drug duplication (n=126), drug–drug interaction (n=21), additive effects (n=14), and therapeutic duplication (n=7) or a combination of those factors. The majority of actual ADEs were due to drug–drug interactions, most commonly involving opioids, benzodiazepines, or cardiac medications; about 75% of the PADEs involved excessive drug doses resulting from order duplication or the prescribing of combination drugs with overlapping ingredients, usually products containing acetaminophen and an opioid. It was determined that 5 (29.4%) of the ADEs and 131 (89.7%) of the PADEs could have been detected through the use of the evaluated CDS tools.

Conclusion a substantial number of actual ADEs and PADEs in the community hospital setting may be preventable through the use of publicly available CDS knowledge bases [7].

The evaluated 2400 patients admitted to cardiac comprehensive care units at an urban academic medical center over a 1-year period showed that in patients with torsades de pointes (TdP) risk factors, implementation of the CDSS independently reduced the prescribing of medications known to cause TdP, including fluoroquinolones, fluconazole, haloperidol, methadone, macrolides or antipsychotics (odds ratio 0.85, 95% confidence interval 0.67-0.99). Utilization of the CDSS was independently associated with a reduced risk of corrected quality of care (QTC) interval prolongation (0.43 (0.25-0.74)) [8].

Also, a study was conducted on 4023 medication orders in a hospital for independent evaluation in two pharmacotherapy-related decision support systems showed that Including laboratory values and other patient characteristics resulted in a significantly higher PPV for the advanced CDSS compared to the basic medication alerts (12.2% vs 23.3%; $p<0.05$) [9].

Another study showed the CDSS improved practitioner performance in 62 (64%) of the 97 studies assessing this outcome, including 4 (40%) of 10 diagnostic systems, 16 (76%) of 21 reminder systems, 23 (62%) of 37 disease management systems, and 19 (66%) of 29 drug-dosing or prescribing systems [10].

We found that the CDSS users were generally satisfied with the system and that it complements the nationwide drug utilization review (DUR) system in reducing ADE [5]. Conclusions Computerized Physician Order Entry (CPOE) substantially decreased the rate of non-missed-dose medication errors. A major reduction in errors was achieved with the initial version of the system, and further reductions were found with addition of decision support features [4].

Conclusion

Finally, in an age of technology to reduce medication errors, clinical decision support system is one of the best systems to prevent and Computerized Physician Order Entry.

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