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A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.
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Bar code scanning to prevent medication errors

Medication errors and medicine related adverse drug events (ADEs) are a significant cause of morbidity and mortality both in Australia and internationally. Identifying interventions that may reduce these events is therefore a high priority for health systems worldwide. Analysis of medication errors indicates that prevention strategies targeting systems rather than individuals are most effective in reducing errors. Emerging evidence suggests that well designed and well implemented electronic medication management (EMM) systems including computerised physician order entry (CPOE) coupled with decision support and bar code scanning technology are effective in preventing medication errors. The Australian Commission on Safety and Quality in Health Care advocate the use of EMM systems as a key mechanism for reducing medication error and a growing number of Australian hospitals are looking towards implementing EEM systems to optimise medication safety. It is reported that 11% of medication errors in hospitals occur during the dispensing phase of the medication use process. Statistics indicate that the majority of dispensing errors involve selection of the incorrect strength of a medicine or selection of the incorrect product. In an effort to reduce dispensing errors the Pharmacy Board of South Australia has mandated that pharmacies and pharmacy departments in South Australia must employ bar code scanning technology as part of the dispensing process from July 2009.

Bar code scanning technology is most effective in preventing dispensing errors if used during the final dispensing check. It involves the pharmacist scanning both the product and the dispensing label bar code. The dispensing software application verifies that the correct medication and strength has been selected. Any discrepancy results in a warning flag to alert the pharmacist. Automating the final dispensing check reduces the potential for human error and while it will not detect an error resulting from incorrect interpretation of a prescription by a pharmacist or from incorrect data entry it will address incorrect product selection, the principle cause of dispensing errors. A recent observational study in a large hospital pharmacy evaluated the impact of bar code scanning technology on medication dispensing errors and potential ADEs. Error rates were measured before and after the implementation of bar code scanning technology and a dedicated repackaging centre. The repackaging centre ensured that each medication to be dispensed was affixed with a readable product bar code. Scanning every dose in the dispensing process resulted in a 31% relative reduction in all dispensing errors, an 85% relative reduction in selection errors and a 63% relative reduction in potential ADEs.

The effectiveness of bar code scanning technology is dependent on the presence of a readable product bar code on medication packaging and is limited by the extent to which pharmacists correctly and consistently use it in the dispensing process. Literature suggests that up to 60% of items dispensed in a hospital pharmacy lack a readable product bar code, either because the manufacturer has failed to provide one or because items are not dispensed in their original packaging. It is therefore questionable whether the results demonstrated in the study above are generalisable to hospital pharmacy departments without repackaging facilities. Bar code scanning technology has been associated with increased inefficiency and errors if users fail to use the technology appropriately, employ workarounds or override alerts. In the research above, dispensing errors detected in the post-barcode period were largely attributable to work-arounds. Inadequate training, process flow issues and technology shortcomings contribute to work-arounds, in which users bypass the intended safety features of the system thereby diminishing its optimal benefits.

The use of bar code scanning technology in the dispensing process will be a new work practice for the majority of South Australian public hospital pharmacy departments. Successful implementation will require workflow redesign as well as training and financial commitment. Bar code technology can improve medication safety, but technology is only as successful as it is usable. A lack of a universally accepted bar coding system & commercially available bar coded products to the unit of use level are barriers to effectiveness as a medication safety initiative.

This E-Bulletin is based on work by Kate Dreyer, Senior Project Pharmacist, RGH.

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