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# AHRQ Study Shows Using Bar-Code Technology with eMAR Reduces Medication Administration and Transcription Errors

Press Release Date: May 5, 2010

Using bar-code technology with an electronic medication administration record (eMAR) substantially reduces transcription and medication administration errors, as well as potential drug-related adverse events, says a new study funded by the Department of Health & Human Services' (HHS) Agency for Healthcare Research and Quality (AHRQ). The study is published in the May 6 issue of the *New England Journal of Medicine*.

Bar-code eMAR is a combination of technologies that ensures that the correct medication is administered in the correct dose at the correct time to the correct patient. When nurses use this combination of technologies, medication orders appear electronically in a patient's chart after pharmacist approval. Alerts are sent to nurses electronically if a patient's medication is overdue. Before administering medication, nurses are required to scan the bar codes on the patient's wristband and then on the medication. If the two don't match the approved medication order, or it is not time for the patient's next dose, a warning is issued.

Researchers at Brigham and Women's Hospital in Boston compared 6,723 medication administrations on hospital units before bar-code eMAR was introduced with 7,318 medication administrations after bar-code eMAR was introduced. Having bar-code eMAR technologies in place was associated with reductions in errors related to the timing of medications, such as giving a medicine at the wrong time, and non-timing medication administration, such as giving a patient the wrong dose.

The researchers documented a 41 percent reduction in non-timing administration errors and a 51 percent reduction in potential drug-related adverse events associated with this type of error. Errors in the timing of medication administration, meaning a patient was given medication an hour or more off schedule, fell by 27 percent. No transcription errors or potential drug-related adverse events related to this type of error occurred.

"Medication errors in hospitals are a very serious issue and can often lead to patient harm," said AHRQ Director Carolyn M. Clancy, M.D. "The good news from this study is that using bar-code technology and an electronic medication administration record together can be an important intervention to help achieve medication safety."

The findings have important implications because bar-code eMAR technology is being considered as a 2013 criterion for meaningful use of health information technology under the American Recovery and Reinvestment Act of 2009.

"Our study shows that this combination of technologies can make the delivery of hospital care safer. However, hospitals need the right set of resources and human talent to deploy these technologies successfully, so more research is needed to identify ways to implement them in the most cost-effective way," said lead study author Eric G. Poon, M.D., M.P.H., of Brigham and Women's Hospital.

**Editor's Note:** AHRQ's health information technology initiative is part of the Nation's strategy to use health IT to improve health care. Since 2004, AHRQ has invested more than \$300 million in contracts and grants to more than 150 communities, hospitals, providers, and health care systems in 48 states to develop knowledge about and encourage the adoption of health IT practices that improve quality and safety.

*For more information, please contact AHRQ Public Affairs: (301) 427-1859 or (301) 427-1855.*