Impact of a Barcode Medication Administration System on Patient Safety

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OBJECTIVES: To determine the impact of barcode medication administration (BCMA) on the incidence of medication administration errors among patients in an onco-hematology day hospital and to identify the characteristics of medication errors in that setting.

SAMPLE & SETTING: 715 patients treated in the onco-hematology day unit at the Príncipe de Asturias University Hospital in Madrid, Spain.

METHODS & VARIABLES: A between-groups, pre-/postintervention study was conducted. Administration errors observed in patients with solid tumors (intervention group) were compared with those in patients with hematologic cancer (control group) before and after the introduction of BCMA. Error incidence, type, and severity were assessed, as was length of stay for treatment.

RESULTS: Use of a BCMA system reduced the incidence and severity of errors in medication administration in the onco-hematology day hospital.

IMPLICATIONS FOR NURSING: BCMA is a useful technology to check the five rights of medication administration in the onco-hematology day hospital and could help nurses increase the time spent on direct patient care activities.

KEYWORDS outpatient care; medication errors; barcode medication administration

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The process of medication administration is the last stage during which a barrier can be erected to prevent an error from reaching the patient. The study and implementation of strategies for error prevention are considered to be priorities by health organizations. Studies of medication administration errors (MAEs) report an incidence of about 7%–20%, and 8% when wrong-time errors, or errors related to the medication administration schedule, are excluded (Berdot et al., 2012; Keers, Williams, Cooke, & Ashcroft, 2013).

The type of medication is important when evaluating the characteristics of errors; health strategies and policies are focused on medications defined as high risk (Saedder, Brock, Nielsen, Bonnerup, & Lisby, 2014). Antineoplastic agents are considered to be high-risk medications because of their narrow therapeutic range and high toxicity (ASHP Council on Professional Affairs, 2002). In a study analyzing the causes of death because of medication errors, antineoplastic medications were found to be the most common agents involved (McCarthy, Tuiskula, Driscoll, & Davis, 2017). The incidence of MAEs in chemotherapy administration ranges from 0.04% (Ford, Killebrew, Fugitt, Jacobsen, & Prystas, 2006) to 18.8% (Walsh et al., 2009). The incidence of MAEs in the outpatient setting range from 0.68% (León Villar, Aranda García, Tobaruela Soto, & Iranzo Fernández, 2008) to 7.1% (Walsh et al., 2009) in the adult population. The outpatient oncology setting is considered to be a priority when reinforcing patient safety (Goldspiel, DeChristoforo, & Hoffman, 2015; León Villar et al., 2008).

Barcode medication administration (BCMA) is recommended for the prevention of MAEs (Lefkowitz, Cheiken, & Barnhart, 1991; Neuenschwander et al., 2003) because it allows nurses to verify the five rights of medication administration (i.e., patient, drug, time, route, and dose). Observational studies on BCMA technology reported a decrease in the incidence of MAEs,