

Improving Efficiency in Elastomeric Pump Filling Using the Diana™ System, a Semi-Automated Compounding Device

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BACKGROUND

La Fe Universitario y Politécnico Hospital is a 1,000-bed, tertiary-care hospital in Valencia, Spain, serving a population of 210,000 people. Each year, the pharmacy department prepares over 35,000 chemotherapy treatments, including the filling of 800 elastomeric pumps.

PURPOSE

The purpose of this study was to compare the mean filling time, accuracy, and nurse satisfaction associated with filling elastomeric pumps using the Diana hazardous drug compounding system and traditional manual filling methods.

MATERIALS AND METHODS

5-FU elastomeric pumps were filled by trained nurses two days a week for four weeks. On the first day, the Diana system was used to fill the elastomeric pumps, and on the second day, the elastomeric pumps were filled manually. Each week, a different nurse filled the elastomeric pumps using both automated and manual methods. The mean filling time, mean filling time considering purge, relative error, and user satisfaction were measured and recorded each day. Accuracy was evaluated by weight of elastomeric pumps (before and after filling). Nurses' satisfaction was assessed by a questionnaire.

RESULTS

Data from this study shows that the filling time, accuracy, and user satisfaction associated with filling elastomeric pumps is dependent on the filling method used. The relative error using the Diana system was approximately 57% lower than using traditional manual methods, measuring 0.314% and 0.735% respectively. In addition, the mean filling time using the Diana system was 3.84 min. (5.52 min. including purge), approximately 10% lower than using manual filling methods, which averaged 4.25 min. (6.63 min. including purge). Data also shows that nurses were "highly satisfied" using the Diana system and were only "satisfied" using manual filling methods.

TABLE 1

	Diana System	Manual Filling	P
Filling Time (Mean)	3.84 min.	4.25 min.	0.008
Filling Time Considering Purge (Mean)	5.52 min.	6.63 min.	< 0.001
Accuracy (Relative Error)	0.314%	0.735%	0.006
Satisfaction	Highly Satisfied	Satisfied	

CONCLUSION

In all tests—mean filling time, mean filling time considering purge, accuracy (relative error), and user satisfaction—the Diana system proved superior to traditional manual filling methods. As a result, it can be determined that the Diana system is a more efficient and accurate method for filling elastomeric pumps than manual filling. The consistency of data across multiple users also suggests that the Diana system is an intuitive and easy-to-use system for clinicians accustomed to traditional manual filling methods.