Preparation times and costs for various solutions used for continuous renal replacement therapy

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Purpose. Results of a study to determine time and cost requirements for final preparation of continuous renal replacement therapy (CRRT) products are reported.

Methods. A 3-phase observational study was conducted at a tertiary care university hospital to evaluate costs associated with manual addition of phosphate and/or potassium to 3 commercial 5-L CRRT products. In the first phase of the study, pharmacy workflow processes for solution preparation were established; in the second phase, pharmacist and pharmacy technician time spent in the CRRT workflow and all materials used were observed and recorded. In the third phase, time and personnel requirements were analyzed in economic terms to estimate final preparation costs.

Results. Through direct observation over 35 days, the CRRT workflow was observed and work times recorded for 511 bag preparations. The main cost contributors were the base CRRT solution and electrolyte additive prices. Technician compounding time differed substantially by solution brand and the need for electrolyte addition. Pharmacist verification time did not differ meaningfully by product.

Conclusion. Preparation and verification of premade CRRT solutions that contained physiological electrolyte concentrations required less technician and pharmacist time than solutions that needed addition of electrolytes in the pharmacy. Personnel costs, which were a small part of the total cost of dispensed CRRT bags, were higher for technicians than pharmacists. The baseline costs of the solutions and the electrolyte additives, if needed, were the main contributors to total cost.

Keywords: compounding, dialysis solutions, hospital pharmacy, pharmaceutical services, pharmacists, renal replacement therapy

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Continuous renal replacement therapy (CRRT) is commonly used to treat acute kidney injury in critically ill patients. CRRT is often a complicated and expensive treatment that depends on collaboration among an interprofessional healthcare team including intensive care unit nurses, nephrology nurses, physicians, pharmacists, and pharmacy technicians.[1,2] A successful CRRT program is dependent on a complicated workflow process including prescribing of CRRT orders, order verification, preparing and checking the custom preparation, delivery, and administration of the CRRT solutions. CRRT solution costs often contribute the majority of the costs associated with CRRT.[2] The availability of ready-made CRRT solutions has led to the general discontinuation of compounding of CRRT solutions from scratch, a practice associated with high error rates.[3,4] Use of ready-made CRRT solutions has led to a reduction in costs associated with solution compounding, and an improvement in patient safety has occurred.[5] None-

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