

BOX 9-1 Workflow Analysis After Implementation of Computer Provider Order Entry

A study of medication administration workflow was conducted after implementation of computerized provider order entry (CPOE) by Tschannen, Talsma, Reinemeyer, Belt, and Schoville (2011). The researchers used mixed methods to gather data about the workflow of nurses. The first step of the analysis was to map the process of medication administration. Tschannen and colleagues interviewed nurses who worked in the target hospital and found that the process had 17 distinct steps.

Next, Tschannen and colleagues observed nurses as medications were being administered, and they timed each step with a stopwatch. The researchers observed 86 medication administrations for 32 hours over a 30-day period in an adult intensive care unit (ICU) and a pediatric unit. The researchers found the mean time for medication administration in the adult ICU was 8.45 minutes and in the pediatric unit it was 9.92 minutes. Nurses who worked in the pediatric unit spent more time preparing medications because they had to crush or dilute medications for children.

The researchers interviewed nurses to better understand workflow issues. They found four main concerns: "systems issues, variations in standards of care, workflow variability, and changes in communication practices" (p. 407). System issues were related to the screen layout in the e-MAR. The print was small, and nurses had to scroll and click more often than they liked. The computers were also slow and at times would not function. Variations in standards of care concerned the lack of a designated time to check for new medication orders. If a stat dose had been entered by a provider in the CPOE, nurses might not know, and the system did not provide an alert. Duplicate orders were problematic for nurses in the system. The nurses also reported that medication reconciliation was more difficult to perform with CPOE than with paper orders. The most profound change was communication between physicians and nurses. Because physicians entered their own orders, there was little need for discussion. Nurses did find the organization of medications in the CPOE to be better than paper orders because the medications could be grouped by name or route, making review much faster. Observations by researchers corroborated the concerns nurses expressed in interviews.

Check Your Understanding

1. What other data-collection methods could have been used to analyze workflow of medication administration after implementation of CPOE?
2. What charts or graphs could be used to illustrate nurses' workflow or concerns with altered workflow?
3. Which changes in workflow after implementation of CPOE could result in medication errors?
4. Could any of the workflow be automated? If so, which processes would benefit from automation?