

Programmable Infusion Pumps Reduce Tragic Medication Errors

Massachusetts General Hospital



Adverse drug events (ADEs) are the leading cause of medical injury to patients in the health care industry. Research has shown the medical procedure with the highest risk for ADEs is intravenous (IV) infusion. For example, the Journal of the American Medical Association has reported that, in a study of pediatric inpatients, 54 percent of potential ADEs were associated with intravenous medication.

To reduce ADEs in the hospital setting, researchers at Massachusetts General Hospital in Boston spent 15 years perfecting a smart drug infusion pump. Led by Nathaniel Sims, M.D., an anesthesiologist in the department of anesthesia and critical care at Massachusetts General Hospital, and assistant professor of anesthesia at Harvard Medical School, the team created an electronic pump that stores a continually updated, hospital-specific database of intravenous drugs and infusion procedures. The pumps prevent errors by comparing the dose rate the clinician enters with the hospital-specific predefined limits for that drug. If the programmed dose is outside the limits, the system alerts the clinician and, in some cases, prevents administration of the medication.

“ *The smart drug infusion pump was immediately put to use in all departments at Massachusetts General Hospital, including operating rooms and intensive care units.*

Affiliates of the hospital are also using the pump, which has been effective in streamlining medication procedures and reducing ADEs.

Massachusetts General Hospital's Corporate Sponsored Research and Licensing Office licensed the technology nonexclusively to several global drug infusion pump manufacturers, including Alaris Medical Systems, Hospira (formerly Abbott Laboratories), Braun Medical, and Sigma International. Widespread use of the pump will reduce drug-dosing calculation errors and misprogrammed.

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