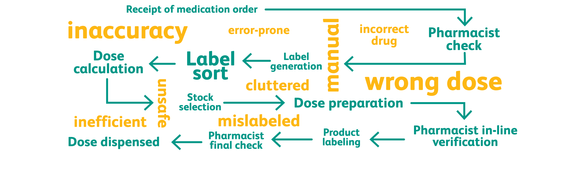
The state of **IV compounding**

It's time for a new standard

Historically, manual IV compounding practices have left gaps for error that compromise patient care and generate costly waste. Today's healthcare facilities must analyze current strategies to enable better control of medication safety, efficiency, inventory optimization and documentation.

A standard day in **manual** IV preparation



An analysis indicated only ***11% of 315 health-system pharmacy directors*** surveyed had implemented an ***IV workflow management system.***[1]

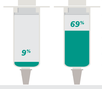
A compounding report revealed that, over a 5-year span, ***30% of hospitals*** experienced a ***patient event*** involving a compounding error.[2]

Not surprisingly, ***KLAS*** reported that ***80%*** of their respondents felt ***IV compounding*** was the area ***most vulnerable*** to making IV medication errors.[4]

A study revealed an estimated ***$2.8 million*** in added annual costs associated with managing ***preventable ADEs*** for a single hospital, with ***pharmacy errors*** accounting for an estimated ***14%*** of preventable or potential ADEs.[1]

The importance of **safe IV preparation**

Traditional IV preparation methods leave a lot up to chance.



One 5-hospital study revealed a mean error rate of 9% for manual IV compounding with ***dosing errors representing 69%*** of the errors.[5]

A study showed 34.7% of chromatography measured morphine infusions ***had concentration errors.***[6]

Another study indicated roughly 13% of volumetric measured doses were ***outside the +/- 10% tolerance range.***[7]

And an academic medical center pharmacy trial showed:

12.5% of chemotherapy preparation **failed accuracy standards** using traditional IV compounding methods.[8]

Did you know that ***ISMP*** states that proxy methods of verification such as the ***syringe pull-back method*** of verification should never be used in the preparation of chemotherapeutic, complex, pediatric/neonatal or high-alert CSPs?[9]

Real risk, real consequences…

In Oregon, a woman received a ***paralyzing agent*** instead of the ***anti-seizure medication*** that was intended.[10]

In Ohio, a two-year-old patient was given a ***fatal overdose*** of NaCl, as a result of the chemotherapy ***medication being compounded*** using 23.4% NaCl solution instead of the standard 0.9% solution.[11]

In Texas, up to ***17 infants*** received as much as ***100x more heparin*** than intended in a NICU as a ***result of a mixing error.***[12]

Cause and effect— **the need to combat inefficiency**

Pharmacies frequently **lack a standardized automated system,** resulting in non-value steps and inefficiency of IV-order processing and compounding.

Pharmacy staff often ***manually manipulate***, sort and label medications, wasting valuable time.

Calculating dosing is ***often done by hand***, increasing risk of human error.

Technicians may need to ***repeatedly leave the IV room*** to inform the pharmacist that preparation is ready for verification, jeopardizing sterile protocol.

More patients and more intricate treatment regimens lead to ***increased demand on pharmacy,*** translating into the potential for prolonged ***patient wait times and dissatisfaction.***

The trouble **with waste**

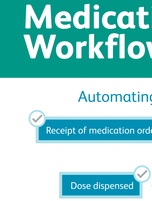
Rework, returns and inadequate drug tracking can really add up.

Drugs routinely consume ***10% to 12% of total hospital expenditures…***[13]

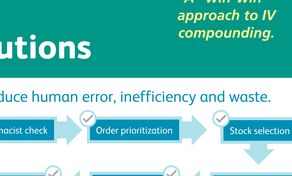
and drugs account for the majority of a pharmacy's budget.

There are more than ***300 drug shortages in the U.S.,*** with most being injectable, sterile medications.[14]

Exacerbating the drug shortage problem, waste can result from expiration, disposal of partially used active ingredients, returned patient-specific drugs and wrongly prepared meds.



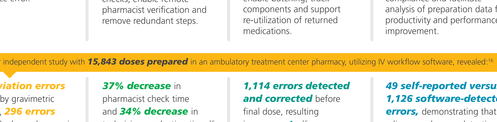
In Indiana, an audit of oncology infusion clinics revealed ***$1 million*** in estimated viable drug ***product was discarded.***[15]



BD Cato™ **Medication Workflow Solutions**

A "win-win" approach to IV compounding.

Automating steps to reduce human error, inefficiency and waste.



Improve medication safety. Utilize ***gravimetrics*** and ***barcode verification*** to minimize error.

Streamline workflow. ***Standardize processes using automation*** to ensure safety checks, enable remote pharmacist verification and remove redundant steps.

Reduce waste. ***Optimize drug inventory*** to minimize expirations, enable batching, track components and support re-utilization of returned medications.

Provide an audit trail. ***Electronically document*** every step to support compliance and facilitate analysis of preparation data for productivity and performance improvement.

A one year independent study with ***15,843 doses prepared*** in an ambulatory treatment center pharmacy, utilizing IV workflow software, revealed:[16]

797 deviation errors detected by gravimetric weighing, ***296 errors*** detected by barcode scanning and ***37 errors*** detected at vial reconstitution.[16]

37% decrease in pharmacist check time and ***34% decrease*** in technician production time.[16]

1,114 errors detected and corrected before final dose, resulting in ***no waste.***[16]

49 self-reported versus 1,126 software-detected errors, demonstrating that reliance on human detection of errors is not sufficient.[16]

Ready to advance IV compounding in your institution?

Visit **bd.com/cato**

References.

1 *IV Workflow Management. Pharmacy Purchasing & Products.* 2012;9(4):9. 2 State of pharmacy compounding 2009: survey findings. *Pharmacy Purchasing & Products.* April 2009. 3 Bates D, Spell N, Cullen D, Burdick E, et al. The costs of adverse drug events in hospitalized patients. *JAMA.* 1997;277(4):307-311. 4 KLAS. *IV robots & workflow management systems, is it time to adopt?* November 2014. 5 Flynn E, Pearson R, Barker K. Observational study of accuracy in compounding i.v. admixtures at five hospitals. *Am J Health Syst Pharm.* 1997;54(9):1110. 6 Parsharam C, To T, Seto W, et al. Systematic evaluation of errors occurring during the preparation of intravenous medication. *Can Med Assoc J.* 2008;178(1):42-8. 7 Poppe L, Savage S, Eckel S. Assessment of final product dosing accuracy when using volumetric technique in the preparation of chemotherapy. *J Oncol Pharm Pract.* September 2, 2014. 8 Seger A, Churchill W, Keohane C, Bebiak C, et al. Impact of Robotic Antineoplastic Preparation on Safety, Workflow, and Costs. Brigham and Women's Hospital, Massachusetts College of Pharmacy and Health Sciences, and Harvard Medical School, Boston, MA. *Journal of Oncology Practice.* 2012. 9 Institute for Safe Medication Practices (ISMP). Proceedings from the ISMP Sterile Preparation Compounding Safety Summit: *Guidelines for Safe Preparation of Sterile Compounds.* 2013. 10 Wisniwacka G. Oregon Hospital: medication error killed patient. *Associated Press,* December 4, 2014. 11 Cohen R. Viewpoint: An Injustice Has Been Done: Jail Time for an Error. *PSQH,* September/October 2009. 12 *Acute Care SMP Medication Safety Alert.* Heparin errors continue despite price, high-profile, fatal events. July 17, 2008. McMichael D, Jefferson D, Carey E, et al. Utility of the ProSeal closed system drug transfer device. *The American Journal of Pharmacy Benefits,* 2011; 3(1):9-16. 14 Policy and Medicine. *Drug shortages: despite gains, many drugs are still in short supply.* April 2013. Updated at Drug Shortages: Current Drugs, ASHP, http://www.ashp.org/DrugShortagesCurrent/ 15 Application of closed system transfer devices for appropriate beyond use dating. BD documentation to the Virginia Board of Pharmacy, May 2015. 16 Reece K, Lozano M, Rioux R, Spivey S. Implementation and evaluation of a gravimetric i.v. workflow software system in an oncology ambulatory care pharmacy. *Am J Health Syst Pharm,* 2016;73(3).

bd.com/cato