



Drug Safety Review

Radiology department: Source of serious med errors

Radiological procedures, which diagnose and treat medical conditions, provide a valuable, lifesaving tool to healthcare providers. Historically, some products used in these procedures (e.g., contrast media and radioisotopes) have not been routinely examined under the scrutiny of the healthcare organization's medication safety program. JCAHO's new 2004 Medication Management Standards include contrast and diagnostic agents among a list of items defined as "medications." Reports submitted to USP and reported in the literature illustrate the serious neurotoxic effects that can result from errors involving ionic contrast media. Also reported to USP and seen in the literature are a number of adverse events that occur in radiology, including allergic reactions and unintended complications of intravenous infiltrations.

However, not all radiology department errors result from inappropriate use of a radiographic product. Errors may also include inappropriate preparation of the patient prior to the procedure, incorrect interruption and/or resumption of an existing IV infusion, and administration of the diagnostic medication to the wrong patient. Thus, it is essential that hospitals and healthcare systems include clinical diagnostic departments, such as radiology, in their strategic medication safety initiatives.

Based on a five-year review of data submitted to USP's MEDMARX program, there were 912 error reports identified in which radiology was listed as the location of the error. Of these, 16.3% ($n=149$) were categorized as harmful, with two fatalities. This harm threshold is eight times higher than the historical

MEDMARX overall average harm threshold of 2%. The top three most frequently reported **Types of Errors** were *Improper dose/quantity*, *Unauthorized/wrong drug*, and *Omission error*.

Safety recommendations

- Include radiology and other clinical diagnostic departments within the purview of the organization's

ing, stocking, and dispensing of these products.

- Review override procedures for retrieving medications from automated drug dispensing cabinets in ancillary departments, and build in additional safety checks to prevent inadvertent withdrawal and administration of an unintended product. Ensure that all automated dispensing cabinets are electronically linked to the pharmacy computer system so drug withdrawals can be evaluated.

- Where policies and procedures dictate, ensure that all appropriate lab test results (e.g., serum creatinine) are available to radiology staff prior to any radiological test.

- Create standardized order forms for radiographic procedures to reduce abbreviation use and dosage miscalculation. Order forms and policies should clarify that a contrast product will not be

dispensed unless the order specifically requests a contrast agent.

- To eliminate serious patient harm from the interruption or misprogramming of IV infusions, establish a protocol to clarify when and how IV infusions should be stopped and resumed.

- Provide routine, ongoing staff education for pharmacy, radiology, and nursing personnel on the medications associated with radiologic tests and treatments, especially when new procedures or tests involve new equipment (e.g., virtual computed tomography [CT] scans). Clinical staff need to readily recognize the signs of an adverse event and have the skills to promptly treat the patient.

Types of errors

Error type	Count	Percent
Improper dose/quantity	166	27%
Unauthorized/wrong drug	135	22
Omission error	96	15
Wrong administration technique	82	13
Prescribing error	52	8
Wrong drug preparation	33	5
Wrong patient	33	5
Extra dose	20	3
Wrong route	19	3
Wrong time	17	3
Wrong dosage form	1	-

* **Type of error is a multi-select field. Not all records documented a specific Type of Error. Data are based on 622 records representing a total of 654 Type of Error selections.**

medication safety program.

- Convene a multidisciplinary team that includes representation from radiology to conduct a failure mode and effects analysis (FMEA) on the ways potentially serious medication errors might occur when patients undergo radiological procedures.

- Review boxed warnings such as "Not for Intrathecal Use" or "Not for Myelography" on product packaging and labeling, and assess if additional warning labels, or signs in storage areas, are needed to make such warnings more prominent.

- Examine where radiographic products are stored throughout the facility, the ease with which they can be accessed, ordering procedures, and the manner in which they are distributed. Pharmacists should play a key role in the order-

by
John P. Santell, M.S., R.Ph.

THE AUTHOR is director of educational program initiatives at USP Center for the Advancement of Patient Safety.

USP operates two complementary reporting programs: the Medication Error Reporting Program, presented in cooperation with the Institute for Safe Medication Practices, and MEDMARX. For more information on how to report errors, visit: www.usp.org/patientsafety.