

Medication errors in radiological services

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Radiological services encompass a broad array of diagnostic and treatment modalities used in patient care and performed by various healthcare practitioners. The number of radiological procedures performed in the United States per year has been estimated at 300 million, of which 20% involve a radiological pharmaceutical.

Radiological service area	n	%
Cardiac catheterization laboratory	825	40.6
Nuclear medicine *	52	2.6
Radiology department	1,155	56.8
Total	2,032	100

* Nuclear Medicine was added as a location to the database in April 2004, and findings for this particular location represent only nine months of data.

USP's Center for the Advancement of Patient Safety analyzed 2,032 medication error records submitted to MEDMARX by 315 facilities during the five-year period of 2000-04 for events occurring in radiological service areas. Of the 2,032 reported errors, 5.7% were categorized as potential errors, 82.3% as nonharmful events, and 12% as harmful. This percentage of harmful records is seven times the 1.7% harm seen in the general MEDMARX data set for all locations for the same five-year period.

Medication errors originated in all phases of the medication use process, indicating that various healthcare professionals with varying degrees of education and training are involved in these events. The great preponderance of errors originated in the prescribing or administration nodes, suggesting that, as a priority, the prescribing and administering processes should be examined to identify latent failures that could lead to harmful events. The data also reveal that many administering errors involve problems with programming IV pumps and stopping

and resuming preprocedure IV fluids.

Some "dispensing" errors involved nonpharmacy staff who directly distributed drug products to the patient or a healthcare provider. The logistics of operating radiology services may necessitate the use of nonpharmacy staff in dispensing radiological pharmaceuticals, but the facility must ensure for the safe storage and distribution of these agents. Other errors involving automated dispensing devices (ADDs) highlight deficiencies in replenishing the cabinet's inventory and should call attention to the procedures used to ensure the accuracy and integrity of the stored drugs.

Breakdowns in written and oral communication were responsible for many errors.

Recurring problems by medication use process node

• Prescribing

- Drug ordered to which patient is allergic
- Failure to adjust dose for decreased renal function
- Incorrect/inappropriate use of standard order sets
- Oversedation requiring reversal agents

• Transcribing/documenting

- Failure to record drug allergies, discontinued drugs, drugs retrieved from ADDs, and drugs given during the procedure
- Incorrect documentation of a patient's weight

• Dispensing

- Incorrect restocking of ADDs
- Incorrect preparation of IV infusion
- Incorrect computer entry of patient weight or drug order
- Wrong product given to patient/family member

• Administering

- Omission of pre-procedural doses

- Giving drug(s) to wrong patient: *correct chart but wrong patient transported to radiology similarly named patients failure to identify patient*
- Incorrect programming of IV pump: *mcg/kg/hour versus mcg/kg/min or mg/hour versus mL/hour "switching" IV infusion rates for two drugs*

Suggestions for improvement

- Include radiology/other clinical diagnostic departments within medication safety program.

- Assess if boxed warnings (e.g., "Not for intrathecal use" or "Not for myelography") are adequate/ways to make them more prominent.

- Examine where radiographic products are stored throughout the facility - ease with which they can be accessed

- ordering procedures

- how distributed

- Review override procedures for ADDs located in ancillary departments.

- Examine how drug allergy information is obtained and documented—is it readily accessible?

- Examine policies/procedures for interrupting/resuming IV infusions.

- Work with lab/others to ensure that all appropriate lab test results (e.g., serum creatinine) are available to radiology staff prior to initiating any radiological test.

For complete data findings on medication errors in radiological services, see <http://www.usp.org/products/medMarx/>.

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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.