

Letter to the Editor

Radiopharmaceutical Misadministrations

Christian's editorial regarding radiopharmaceutical responsibilities (1) underscores several important observations concerning diagnostic and therapeutic misadministrations in nuclear medicine. We agree that in nuclear medicine both the number and incidence of reported misadministrations are small compared to other hospital-based medication errors (1-4), and that nuclear medicine technologists are to be lauded for their conscientious attention to purpose.

Nonetheless, we believe it would be of value to take a brief, more in-depth look at some of the causes for the reported low patient misadministration rate in nuclear medicine (0.01%) and the reported higher error rate (11-22%) in the hospital system. It is difficult for us to believe that the misadministration rate in nuclear medicine is more than a thousand times better than in the hospital at large. These figures suggest to us that this comparison might be somewhat analogous to an "apples and oranges" comparison.

Medication errors for hospital patients consist of many different types: errors of omission, incorrect dose, incorrect drug, extra dosing, administration of unordered drug, incorrect dosage form of prescribed drug, incorrect sequence, dosing of drug at incorrect time of day or night, etc.

The categories of errors of omission, extra dosing in which a drug is given repeatedly, and errors in which a drug is given at the incorrect time account for 76% (3) of the total medication error rate to hospitalized patients. The causes for some of these most common errors include: ambiguous or incomplete physicians' orders, incorrect abbreviations, misinterpreted handwriting, drug dispensing errors, lack of complete and proper patient identification, and distribution and administrative systems failure. For nonradioactive drugs administrations, the communication arrangements are also far more complex. At the same time, the average patient receives 5 to 10 medications a day and must be specifically identified from within a much larger patient unit and hospital population.

In the nuclear medicine department usually one patient is attended to at a time—by a single or specified technologist—for a single particular study, with a single drug administered only once (although multiple drugs may occasionally be administered concurrently, e.g., liver/lung scan(s) with sulfur colloid/MAA). The question of patient noncompliance is minimal since most doses are parenteral and oral doses are under direct supervision. Additionally, the employee population is generally more stable with less rotation and shift turnover among the staff, allowing for closer and more dependable working relationships and enhancing the consistency of communicated directives. There is a relatively smaller number of drug entities to be prescribed (and possibly confused) with infrequent pharmacologic effects. The prescribing communication is usually direct (one-to-one or by protocol that establishes a dosage range to be used

repeatedly), and the technologist has greater access to the original prescriber or other expert information.

While all hospitals and nuclear medicine departments have reporting mechanisms in the case of a misadministration, the reporting mechanism is probably somewhat more uniform in nuclear medicine; this is largely due to the NRC and state BRH reporting requirements. Certainly there are misadministrations that do not get reported; however, we know of no comparative quantitative analysis between hospital and nuclear medicine rates of nonreporting.

It is important to recognize that there is an inherently different structure between hospital dispensing and nuclear medicine dispensing with more potential for error existing within the hospital. Many of the complexities accompanying drugs with pharmacologic effects do not apply in the nuclear medicine dispensing structure. It is this difference—between drugs with pharmacologic action and diagnostic or therapeutic radiopharmaceuticals—that gives us the opportunity to be thankful for the low misadministration rate and also to acknowledge the competence of all nuclear medicine personnel.

BALWINDER MALHI, MS
GEOFFREY LEVINE, PhD
Presbyterian-University Hospital
University of Pittsburgh
Pittsburgh, PA

References

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Reply

I wish to thank Malhi and Levine for highlighting the differences between nuclear medicine and hospital misadministrations. Although there are many factors that may increase the probability of nonradioactive drug misadministration to patients, nuclear medicine is in the unique position of identifying nearly all misadministrations because they are evident when the patient is imaged. Despite the many differences in staffing and the considerably lower number of administrations in nuclear medicine compared to nonradioactive drugs, a misadministration rate of 0.01% is incredibly low. This rate indicates that nuclear medicine technologists are very conscientious in the handling and administration of radiopharmaceuticals. High technology health care must never overshadow our responsibility to the care and safety of the individual patient.

PAUL E. CHRISTIAN
Editor