NRC Simplifies Regulations for Medical Use of Byproduct Material (10 CFR Part 35)

The US Nuclear Regulatory Commission (NRC) recently completed a five-year project to update and simplify its "Medical Use of Byproduct Material" regulations (10 CFR Part 35). The final revision, which becomes effective on April 1, 1987, was published in the *Federal Register* on October 16, 1986 (pp. 36932–36968).

The agency undertook the project "as an attempt to streamline the licensing process," said Norman L. McElroy, an NRC health physicist who was project manager for the revised regulations. License amendments were typically backlogged for several months because of incomplete applications and amendment requests that resulted from "incomplete and unclear requirements," said Mr. McElroy.

Originally, the plan was to consolidate all medical use requirements (whether placed by license condition, regulation, or licensing policy) in the regulation, and then allow applicants to certify that they had established a radiation safety program that met those requirements. The NRC commissioners remanded that draft regulation to the staff with instructions to "continue the prelicensing review of applicants' operating procedures by NRC licensing staff."

"I think the NRC has done an incredible job with this revision," said Capt. William H. Briner, chairman of The Society of Nuclear Medicine's (SNM) Government Relations Committee. The revision "improves the regulatory situation for nuclear medicine," and SNM members will probably be surprised at the simplicity of the new regulations, said Capt. Briner.

The NRC has withdrawn the requirement that physicians use diagnostic radiopharmaceuticals for only those indications listed on the package insert.

[Once a drug is approved by the US Food and Drug Administration (FDA), physicians can use that drug for indications not listed on the package insert under the legal provisions for "the practice of medicine" in the US Food, Drug, and Cosmetic Act. Before the NRC revised 10 CFR 35, however, the one exception was radioactive drugs, which could be used only for approved indications.]

The NRC decided that this requirement "may have an adverse impact on the public health and safety because it prevents physicians from performing diagnostic clinical procedures needed by their patients."

As a separate project, the NRC is reviewing its physician training and experience criteria (see *Newsline:* March 1985, pp. 221–223; June 1985, pp. 557–558; May 1986, p. 590). Any proposed changes will be published for public comment as a separate rulemaking action.

Misadministration Reporting Rule

One remaining problem cited by Capt. Briner, however, was that the NRC didn't abolish the misadministration reporting requirement, "which should not be required for diagnostic radiopharmaceuticals." Although the proposed rule had made no changes in the misadministration reporting rule, the commissioners had directed that the proposal solicit public comments, particularly with regard to the adequacy of the rule and how well it can be enforced.

Based on the comments received, the NRC staff recommended that the diagnostic misadministration reporting rule be revised. "The staff had dismissed the argument that the radiopharmaceutical misadministration rate was already much lower than the misadministration rates for other drugs," said Mr. McElroy. "Instead, the real issue was whether a safety problem existed and, if so, could it be corrected at an expense that is reasonable compared to the hazard," he explained.

An analysis of reports indicated that the hazard was not sufficient to merit additional safety requirements, and that the reporting requirement had fulfilled its stated objective—to determine the frequency and cause of misadministrations. The NRC staff recommended that diagnostic misadministrations only be reported if the dosage was five-fold different than the intended dose, or if the organ dose exceeded 15 rads, said Mr. McElroy.

The NRC commissioners directed that the final rule be revised to require diagnostic misadministration reports to the NRC and the referring physician if the whole-body dose exceeds 500 mrem or if the organ dose exceeds 2 rem, that reports be submitted on a standard form, and that the misadministration reporting requirement be made an "item of compatibility" for agreement states.

[In the United States, there are 28 agreement states (which formulate their own radiation safety regulations that must include designated items of compatibility from NRC regulations), and there are 22 nonagreement states (in which the NRC regulates medical use of byproduct materials).]

When the NRC staff revised its proposed regulation, they took that opportunity to reexamine some of the concerns raised by the agreement states. In addition to making several technical comments, said Mr. McEl-

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roy, "the agreement states expressed strong concerns over a provision that would allow licensees to make changes in their radiation safety programs."

Minor Changes

In an early comment letter, Mary Lou Blazek, then of Oregon's Radiation Control Section, said that "essential procedures should be approved prior to licensure, or else they may never be reviewed for adequacy."

The staff revised the change provision to allow only "minor changes," and took the regulation back to the commissioners. Although they all voiced concern over the minor change provision, Nunzio J. Palladino, PhD, then chairman of the NRC, stated: "The proposed revision is a marked improvement and, as such, should be issued for comment. The issues raised can be better addressed by the staff during the comment period." The other commissioners agreed, and the proposed revision was published in the *Federal Register* on July 16, 1985.

Minor Change Provision Retained

According to Mr. McElroy, one of the most difficult tasks was defining a minor change. "It's like most judgment calls—there is always some disagreement," he added.

The proposed rule had defined major changes, which would require license amendments, as: new authorized users, new types of use, increased inventory limits, or a new address. All other changes were deemed minor.

In their comments, licensees generally agreed that the proposed threshold for license amendments was reasonable. The agreement states, however, voiced continued concern. The commissioners directed that the final revision require: "Prior NRC approval for changes in procedures that are potentially important to safety. Minor changes in procedures that are not important to safety need not have prior NRC approval."

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The final rule added to the list of major changes "areas of use" within the hospital, and explained that "minor changes" are ministerial in nature—they are made by persons in authority in conformance with the requirements and without making a discretionary judgment about whether those requirements are needed in the case at hand to assure the public health and safety.

The regulatory text provides examples of minor changes, such as editing procedures for clarity, updating of names and telephone numbers, or conformance with local drafting policy; adoption of NRC model procedures; replacement of equipment; reassignment of tasks, or assignment of service contracts.

The final rule "is not restrictive enough, in my personal opinion," said Ms. Blazek, who also served as the liaison between the NRC staff and the agreement states. The revision of 10 CFR 35 is an improvement for large medical centers because they will be able to get their licenses more quickly, said Ms. Blazek, but she said that she's not "at all certain that it will improve safety in nuclear medicine."

In the use of xenon gases, for example, Ms. Blazek said that some well-qualified personnel were found to lack an understanding of the ventilation process for scanning rooms, and weren't using hoods properly. Ms. Blazek said that she is in favor of allowing licensees to make minor changes in their radiation safety programs, although there is some disagreement on the definition of a minor change. "I have inspected several hospitals, for example, where the staff would say that they were planning to remove a door and, again, they hadn't realized that this change would affect their ventilation for xenon studies," she explained.

The majority of licensees are well qualified physicians and technologists, stressed Ms. Blazek, and the revised regulations will be a real help to them. "Where I have some radiation safety concerns are in very small departments where maybe the physicians are not as involved as they need to be, or perhaps the technologists are inexperienced or inadequately trained," she added.

Kirk Whatley, director of the Radioactive Material Licensing Section in Montgomery, AL (an agreement state), expressed some concern over the minor change provision. Licensing agencies have the responsibility of assuring that radioactive materials are used safely, said Mr. Whatley, "and if a licensee is allowed to change procedures without any review by the licensing agency, then no assurance is guaranteed, and in my opinion, I don't understand how a license can be issued on that basis."

Supervision Defined

The proposed rule had provided an operating definition of supervision that would have required authorized users to be immediately available by telephone and physically present with one hour's notice. One commenter said that the definition was unreasonable because it would not allow him to leave his patients in the care of capable residents who had worked under his personal supervision for several months.

The regulation was revised to allow licensees to exercise whatever level

Clarifying the New NRC Misadministration Reporting Rules

Many questions have arisen concerning changes in the misadministration reporting requirement published by the US Nuclear Regulatory Commission (NRC) in its final revision of "Medical Uses of Byproduct Material," 10 CFR Part 35 (*Federal Register,* Oct. 16, 1986, pp. 36932-36968).

Diagnostic misadministrations must be reported if: the dosage is five-fold different than prescribed; material not intended for medical use is administered; or the patient will receive an organ dose of 2 rem or a whole-body dose of 500 mrem.

Will diagnostic misadministrations continue to be reported as they are now? Reports will have to be submitted within 15 days in writing to the NRC and the referring physician on an NRC form designed specifically for this purpose. When notifying referring physicians, licensees may include a cover note explaining the reporting requirements.

Must dose calculations be patient-specific? Dose calculations may be made by using the dosimetry tables in the package insert, corrected only for dosage administered. There is no requirement to correct for the patient's size, organ mass, or compartment transfer rates. Although these corrections would make the calculation more accurate, the NRC believes that to require them would be unduly burdensome.

How much effort should be spent on making calculations? For most cases, in which the calculations simply require multiplying whole-body and target-organ doses in the package insert by the dosage administered, the calculations should each take less than a minute. The NRC expects a licensee to expend the appropriate effort in calculating the dose to the patient and does not believe, in most cases, that this effort will be inordinate.

How does one calculate dose in cases of wrong-route misadministrations, where dosimetry models are not readily available? In those few cases where the package insert does not provide sufficient information, the licensee may use the Medical Internal Radiation Dose (MIRD) tables or a dosimetry algorithm that has been published in the literature or a textbook and assume a fairly simple compartment model (examples, *1,2*). This question, however, may be a theoretical one. The NRC's analysis of diagnostic misadministrations reported to date shows that virtually 100% of these events involve administration of the wrong radiopharmaceutical (74%), the wrong dosage (4%), or administration of a radiopharmaceutical to the wrong patient (22%). Based on the reports submitted, the NRC believes that almost all diagnostic misadministrations involve conventional administrations and radiopharmaceuticals, for which dosimetry is provided in the package insert (*3*).

How does one calculate dose in cases of pediatric misadministrations? The NRC does not have any information about the number of diagnostic misadministrations involving children, but believes the number is small based on reports that provide the patients' ages. In unclear cases the licensee may consult the licensing staff.

If a misadministration were unreported because the licensee, based on an incorrect dose calculation, believed no report was required, would a citation be issued? A diagnostic misadministration, with its attendant calculation, is no different than other reporting requirements based on a combination of physical measurements and calculations—the NRC expects its licensees to make these calculations correctly. If these calculations are made improperly and a licensee, as a result of this error, fails to report an event, a severity-level-IV violation has occurred. The NRC will issue a notice of violation that requires a formal response from the licensee describing corrective actions.

Norman L. McElroy
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References

1. Marcus CS, Stabin MG, Watson EE: Pediatric radiation dose from ^{111}In leukocytes. *J Nucl Med* 1986, 27:1220-1221
2. Shapiro J: Part III—Radiation dose calculations. In *Radiation Protection: A Guide for Scientists and Physicians.* Cambridge, Harvard University Press, 1972
3. McElroy NL: NRC reports on misadministrations and unannounced safety inspections. *J Nucl Med* 1986, 27:1102-1106

of supervision is needed, said Mr. McElroy. All tasks, from package receipt through quality control, prescription, administration, interpretation or follow-up for individual clinical procedures, and radioactive waste disposal may be delegated.

Prior instruction and periodic review of work habits and records is required, noted Mr. McElroy. The licensee retains responsibility for the acts and omissions of the supervised individual, he added.

[For more information on how the revision of 10 CFR 35 will affect the agreement states, contact: Lloyd Bolling, Office of State Programs, NRC, Washington, DC 20555 (301) 492-9889.]

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