U.S Nuclear Regulatory Commission
Advisory Committee on the Medical Uses of Isotopes
Training and Experience for All Modalities Subcommittee

Final Report

Subcommittee Review and Comments on

Draft NRC Commission Paper Entitled "Evaluation of Training and Experience Requirements for Administration of Radiopharmaceuticals Requiring a Written Directive"

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Subcommittee Charge:

In 2016, the U.S. Nuclear Regulatory Commission's (NRC) Advisory Committee on the Medical Uses of Isotopes (ACMUI) Subcommittee on Training and Experience (T&E) Requirements for All Modalities was charged to periodically review the T&E requirements for the medical use of unsealed byproduct material (Title 10 *Code of Federal Regulations* (10 CFR) Part 35, Subparts D-H), and to make recommendations for changes, as needed.

Subcommittee Sub-charge:

The current charge of the Subcommittee on Training and Experience for All Modalities is to review the recent NRC staff draft Commission paper[1] which presents potential changes to the T&E requirements for the administration of radiopharmaceuticals under 10 CFR Part 35, "Medical Use of Byproduct Material," Subpart E, "Unsealed Byproduct Material - Written Directive Required."

Prologue:

The Subcommittee congratulates the NRC staff for their thoughtful and creative evaluation of this matter. We believe their considerations to be responsive of stakeholders, the Organization of Agreement States (OAS), and the Advisory Committee on the Medical Uses of Isotopes (ACMUI) input and appreciate the opportunity to comment on the draft paper.

[1] *Draft for Review – Evaluation of Training and Experience Requirements for Administration of Radiopharmaceuticals Requiring a Written Directive.*

Several NRC-proposed options demonstrate an evolving regulatory and radionuclide therapy landscape. Some Subcommittee members' thinking has also evolved. Given the heterogeneity of disciplines, roles, and practice environments represented in the Subcommittee, we have not reached a unanimous consensus. Our report therefore includes a summary, recommendations, and, one Subcommittee member's minority opinion.

Introduction:

The staff's draft Commission paper builds on extensive public stakeholder feedback, consultation and coordination with the OAS and the ACMUI, as well as review of corresponding international regulations, review of related medical events, and consideration of how the current T&E requirements conform to a risk-informed approach and align with the NRC's Medical Policy Statement.[2]

Feedback from the OAS, NRC staff, and others introduced uncertainty as to whether the current T&E requirements conflict with the Medical Policy Statement's affirmation that "…*the NRC will not intrude into medical judgments affecting patients to provide for the radiation safety of the workers and the general public.*" This informs several of the proposed options for changing the T&E regulations.

As to ongoing concerns for a current or burgeoning shortage of authorized users (AUs) affecting patient access, the draft paper concludes that the NRC staff could not determine whether the number and location of licensees are sufficient to satisfy patient demand, and importantly, "…*the NRC cannot regulate T&E with a primary goal of increasing patient access to radiopharmaceuticals or improving geographic distribution of AUs.*"

In the draft report, NRC staff also discussed that emerging radiopharmaceutical therapies are growing in volume, are increasingly patient-focused, and that administration protocols of these emerging radiopharmaceuticals will inherently be more complex.

In response to the above, the draft paper provides two major regulatory approaches for Commission consideration:

1) A performance-based approach that removes the current prescriptive T&E requirements and NRC review and approval of AUs; and

2) Maintaining and/or enhancing the NRC's existing regulatory framework for T&E.

There are three sub-options under the first approach, and four sub-options under the second.

Subcommittee Comments on the Draft Options:

Approach One – Removal of Prescriptive T&E Requirements and NRC Review and Approval of AUs

Option 1a. "Specialty Board Credentialing," where physicians must be certified by any medical specialty board to use radiopharmaceuticals.

[2] "Medical Use of Byproduct Material; Policy Statement, Revision" (65 FR 47654; August 3, 2000).

Credentialing is a process where medical facilities grant healthcare professionals (physicians, non-physician mid-level providers) the ability to practice medicine in their clinical sites. Board certification is a national "gold standard" of set criteria developed by an association that many boards subscribe to, called the American Board of Medical Specialties (ABMS). This certification guarantees that an ABMS board certified physician has met a specialty board's minimal competency requirements which are routinely reviewed and updated, as opposed to non-ABMS boards which might not regularly update the requirements.

The current 24 ABMS boards and the American Osteopathic Boards of Radiology (AOBR) and Nuclear Medicine (AOBNM) certify that a physician has acquired a level of knowledge and skills which mirror the specific specialty's Accreditation Council for Graduate Medical Education (ACGME) residency or fellowship program training requirements. Additionally, these requirements are routinely reviewed and (as needed) revised to provide the most up-to-date content for patient care. These boards require initial and ongoing certification for their diplomates to attain and maintain board certification which are accomplished through initial board certification exams and a recertification process which is either a maintenance of certification exam, continuous certification, or a continued longitudinal assessment process through "Online Longitudinal Assessment" or OLA. The public is then assured that an ABMS, AOBR, or AOBNM board certified physician has acquired and maintains a national quality peer-approved standard of knowledge and skills in the current practice of a particular medical specialty.

Determining AU status by specialty board certification for non-radiation related specialties creates a unique set of challenges. In our view, such a certification must provide the same high level of knowledge of radiation safety and care as the current deemed-status Boards. As delineated in 10 CFR 35.390 this requires extensive T&E of appropriate topics which currently requires 700 hours devoted to these topics. This would require other boards to provide and develop the expertise among their membership to develop the curriculum and create training programs for their new trainees, and those already in practice within their specialty.

If Option 1a were to allow specialty boards to significantly dilute educational and training requirements to determine AU status as each board sees fit, we have significant reservations, as we believe this would compromise patient and public safety.

While addressed in Option 1c, the draft report does not state whether or not an alternate pathway would continue to exist under Option 1a.

Option 1b. "Licensee Credentialing," where licensees must develop their own procedures to determine whether their physicians are adequately trained to use radiopharmaceuticals.

There are thousands of U.S. medical licensees, thereby raising two major concerns for this option. Current T&E requirements are based on NRC regulations in 35.390. Without this national standard, thousands of AUs may be approved with varying levels of local or site-specific determined "expertise," resulting in a wide disparity in "expert practice." Additionally, if the AU relocates to a different hospital or medical facility, the site-specific licensee credentialing may not be equivalent, and hence, would need to be initiated as a new application with potentially disparate T&E requirements.

Furthermore, a lack of uniform nation-wide standards would present a serious potential of compromising public health and safety. With Option 1b, there will be no standard platform of AU

credentialing, and local or site-specific responsibility for determining licensee credentialing might be administratively conducted without a physician in that specific specialty, or perhaps be delegated to a non-physician.

A second concern is that with thousands of individual site-specific licensees, the regulatory and inspection oversight would be immense and cost prohibitive. It is also uncertain how this would be operationalized in small clinics and stand-alone practices with minimal administrative infrastructures. Due to these concerns, Option 1b does not appear to be a viable or practical alternative in achieving an AU status that would ensure public health and safety.

Option 1c. "NRC-Recognized Specialty Board Credentialing," where physicians must be certified by a medical specialty board recognized by the NRC.

The subcommittee is concerned with how the NRC intends to develop and broaden its board certification criteria for the therapeutic use of radiopharmaceuticals, and to align it with emerging radiopharmaceuticals. Any newly proposed medical specialty board certification that would be recognized by the NRC for radiopharmaceutical therapy covered under 35.390, must ensure completion of an appropriate number of hours of didactic education and hands-on training and experience to assure public health and safety.

There are three boards that have achieved certain NRC recognition (or "deemed-status") for the use of unsealed byproduct material requiring a written directive (the American Boards of Radiology and Nuclear Medicine and the American Osteopathic Board of Radiology). This NRC recognition is conferred on a medical specialty board as a formal acknowledgment of meeting and continuing to meet NRC requirements for AU status for its certified diplomates. That recognition is at least partially based on those boards' requirements for comprehensive training, content, and experiential components in radiobiology, dosimetry, and radiation protection practices. Subcommittee members questioned if, and generally have an expectation that, newly proposed boards would meet the same high level of T&E as current NRC recognized Boards.

The draft Commission paper also indicates that the alternate T&E pathway for AU status (10 CFR 35.390(b)(1)) will no longer exist under Option 1c. As currently used, the alternate pathway offers flexibility and timely certification of new authorized users.

Approach Two: Maintain or Enhance the Existing T&E Framework

Option 2a. "Status Quo," would make no changes to the NRC's T&E requirements.

The current practice of radionuclide therapy under the requirements of 10 CFR 35.390 has maintained public health and safety as evidenced by the very few reported medical events in the National Medical Events Database (NMED) relative to the overall annual number of radionuclide therapies in the U.S. This was further supported by the public stakeholder input from the nuclear medicine and radiation oncology communities, as well as the ACMUI. Furthermore, the requirements are widely distributed and familiar to licensees, regulators, and training programs.

As practitioners in the medical radiation specialties, we do not feel the current regulatory T&E standards are in conflict with the Medical Policy Statement. The ACMUI Subcommittee continues to support this option.

Option 2b. "Tailored Requirements," would tailor and reduce T&E to create additional AU pathways for administration of specific categories of radiopharmaceuticals.

One of the key elements of Option 2b is to reduce training requirements in cases where the licensed material is received as a unit dose. The Subcommittee believes that handling a radiopharmaceutical in unit-dose form alone does not decrease the required level of safety to warrant a reduction in training. Even in unit dose form, licensees can spill licensed material during injection. In addition, some newer radiopharmaceuticals, including those with unit doses, have more complicated administration protocols.

Option 2b would likely be exceptionally burdensome for the NRC as a careful review of applicable T&E elements will need to be entertained time and again as new agents are developed. Furthermore, this variegated system would present regulatory challenges for the regulator, AU, and RSO in determining whether a particular AU was authorized for a particular agent.

Option 2c. "Emerging Radiopharmaceuticals," would conduct individual reviews of each new radiopharmaceutical to determine drug-specific tailored T&E and other related requirements.

Individual reviews of each emerging radiopharmaceutical under 35.1000 would be time-intensive and potentially delay introduction or access to new therapies. This would also create the potential for inconsistent requirements, since 35.1000 guidance has a compatibility level D, which allows for significant variation in the Agreement State regulation. It would also be burdensome to re-authorize every AU for each new emerging radiopharmaceutical. The radiation safety differences between 35.300 radiopharmaceuticals are not significant enough to require radioactive drug-specific review of T&E. If for some reason there would be a unique hazard with a new radiopharmaceutical, the NRC could then classify and license that drug under 35.1000.

Determining the required training for these tailored approaches to each emerging radiopharmaceutical would be time-intensive and require multiple regulatory steps, which might be counter-productive for facile adoption of future novel radiopharmaceuticals. The Subcommittee believes that if the NRC classifies a radiopharmaceutical in 10 CFR 35.300, the existing training requirements under 35.300 are adequate.

Option 2d. "Team-Based Requirements," would create an additional alternate pathway in which T&E requirements for AUs would be reduced based on pairing AUs with other individuals with radiation safety T&E.

Designating multiple potential "authorized individuals" in various specialties, *e.g.*, authorized nuclear pharmacist (ANP), would be confusing as to when one AU's responsibility ends and another's begins, or, there may be overlap and confusion when an unexpected complication occurs during or post procedure. While a licensee must have a Radiation Safety Officer who is knowledgeable in the applicable regulations, radiation safety requirements, and emergency procedures; the AU should also be independently knowledgeable in these areas for the modalities in which they practice. We are concerned that safety may be compromised when the physician is not sufficiently knowledgeable of the dangers of radioactive materials in patient care. Given the hierarchical culture in medicine, an authorized nuclear pharmacist (ANP) or authorized administrator may not have the freedom or authority to assure safety when the

physician does not fully appreciate the dangers inherent in radioactive materials use, or the required mitigating procedures.

Other considerations for a partnered or multiple AU team approach (in its execution and its regulation) are the asymmetric scopes of practice and authority and associated legal and reimbursement issues.

Summary of the Subcommittee Review:

Approach One: Removal of Prescriptive T&E requirements and NRC Review and Approval of AUs

- The Subcommittee does not support Options 1a or 1b.

- Option 1c may be feasible if the appropriate level of training and experience is required. If the NRC applies sufficient rigor in evaluating radiation-related content and competencies as discussed above, new boards could possibly provide an appropriate level of radiation protection regarding public health and safety.
  As mentioned earlier, Option 1c does not provide an alternate pathway. The Subcommittee recognizes the value and flexibility of the alternate pathway.

Approach Two: Maintain or Enhance the Existing T&E Framework

- For any therapy utilizing the administration of unsealed byproduct material requiring a written directive, the AU must have acquired a basic foundation of knowledge, skills and experience to perform these radiopharmaceutical therapies safely and effectively. This level of expertise applies to physicians in both radiation and non-radiation related specialties/subspecialties.

- Currently, and with the advent of new and emerging radiopharmaceuticals, Option 2a, (maintaining the current T&E or *status quo* for AUs under 10 CFR 35.390) appears to be the best approach.

- Option 2b, “tailored T&E” for a single industry-specific radiopharmaceutical requiring a written directive, was reviewed. In considering this pathway, the AU applicant should acquire a fundamental base in radiation related topics; including comprehensive radiation protection training, equivalent to that of an AU under 10 CFR 35.390. Subsequently, the individual must attain the clinical experience for the requested therapy. This seems likely to create a chaotic system with significant burden on the NRC to develop T&E requirements for each agent, and confusion among regulators and AUs about which agents each AU is authorized to use.

- The Subcommittee does not support Option 2c. Evaluation of all emerging radiopharmaceuticals under 35.1000 guidance would be overly burdensome and time-intensive.

- Lastly, Option 2d, a team-based, “partnered AU” approach to radionuclide therapy may be problematic for reasons stated above.

Subcommittee Recommendations:

1. The Subcommittee recommends maintaining the *status quo* under 10 CFR 35.390. While strongly affirming the structural superiority of the status quo over the other options proposed in the draft paper, we acknowledge there is room for a comprehensive review of the specific requirements in 35.390 such as the seemingly arbitrary requirement of 700 hours. The Subcommittee (and likely, ACMUI) would welcome the opportunity to critically asses these details.

2. If the NRC proceeds to grant AU status by NRC-recognized specialty boards, the T&E should be equivalent to 35.390.

3. The Subcommittee recognizes the value of an alternate pathway and is willing to review and evaluate the requisite knowledge, preceptor-reviewed experience, and competency assessments.

Minority Opinion:

Based on discussions with other State regulators, inspection experience, and NRC's research, I encourage NRC to consider alternatives to the existing T&E requirements in 10 CFR 35.390. This presents an opportunity to move to a T&E framework that is more separated from practice of medicine issues and focuses more intently on radiation safety of workers and the public:

- The choice to prescribe a radiopharmaceutical is a practice of medicine issue, not within NRC's domain. The medical community has processes in place to limit a physician's scope of care, for example through hospital credentialing based on specialty board certification. NRC should not require T&E for physicians who sign written directives, unless the physician actually handles licensed material.

- NRC should shift its T&E regulatory framework to focus on T&E for individuals who *handle* or *administer* 10 CFR 35.300 radiopharmaceuticals because these are the individuals responsible for delivering the treatment in accordance with the physician's prescription.

- To move toward this shifted framework, I support a hybrid of Option 1b and Approach 2, where authorized user physicians are not individually listed on a license but are subject to training and certification requirements in 10 CFR 35. For comparison, NRC regulates high-risk industrial uses of radioactive material, and a very similar user training model has been in place for industrial radiography licensees for many years:

    - Radiographer T&E requirements are in regulation (10 CFR 34.43);
    - Radiographers must pass a radiation safety exam given by an external certifying entity on a recurring basis (every five years);
    - Radiographers are not listed on NRC licenses; and,
    - Radiographer certification is verified during inspection.

This hybrid option would lessen the administrative burden on licensees and NRC to amend licenses to track specific physician authorizations, an effort which currently consumes an enormous amount of regulatory resources but has only an indirect link to radiation safety at most medical institutions. In addition, this option would maintain uniform, high initial training

standards for individuals who handle radioactive material at medical facilities, and it would allow NRC to shift its regulatory focus to the individuals most directly responsible for radiation safety.

This report was unanimously approved during a public teleconference meeting of the ACMUI on October 17, 2019.

Respectfully Submitted on October 23, 2019,
Training and Experience Subcommittee
Dr. A. Robert Schleipman, Chair