MEETING OF THE
ADVISORY COMMITTEE ON THE
MEDICAL USES OF ISOTOPES

October 13-14, 2004

MEETING SUMMARY

PURPOSE: To discuss issues related to the implementation of the medical regulations in 10 CFR 35, "Medical Use of Byproduct Material."

OUTCOME: The Nuclear Regulatory Commission (NRC) staff gained more understanding of the views and opinions of the Advisory Committee on the Medical Uses of Isotopes (ACMUI), as well as other stakeholders' views and opinions. Staff will consider these views in its continuing effort to make 10 CFR 35 more useful, practical, and not overly burdensome on licensees, while maintaining public health and safety.

WEDNESDAY, OCTOBER 13, 2004

RADIOIMMUNOTHERAPY AND MICROSPHERE THERAPY

Donna-Beth Howe, PhD, NRC, presented this topic to the ACMUI. During this presentation, Dr. Howe discussed current NRC policy, regulations, and the training and experience (T&E) requirements regarding antibody-linked radionuclide therapy and microsphere therapy.

Subir Nag, MD, ACMUI, also made a presentation on this topic to the ACMUI. During this presentation, Dr. Nag discussed his views on issues regarding NRC regulation of these therapies. His general views are as follows:

- The nature of these therapies can make it difficult for the practitioner to contain the dose
- The dose distributes in a non-uniform manner in the liver (the target organ)
- Due to the size of the radioactive seeds, they behave like a liquid although they are solid

Because of the unique nature of microspheres, they are currently regulated in 10 CFR 35.1000, "Other medical uses of byproduct material or radiation from byproduct material." Nevertheless, microspheres contain characteristics of byproduct material that is regulated under 10 CFR 35.400 as well as 10 CFR 35.600.

ACMUI Recommendation: That NRC staff continue to regulate microsphere therapy in 10 CFR 35.1000, but use 35.400 as the regulatory framework for creating guidance, while adding elements of 10 CFR 35.600, as necessary, to that guidance.

REGISTRATION OF BRACHYTHERAPY SOURCES

John Jankovich, PhD, NRC, gave information to ACMUI regarding the background on existing registration of brachytherapy seeds and current guidance for registering seeds. Dr. Jankovich explained the requirement for registration, the standard for acceptance for sources to be placed into the registry, the contents of a registration certificate, and the conditions of normal use for brachytherapy seeds (i.e., permanent or temporary interstitial treatment.) Dr. Jankovich described the conditions of use to prepare the committee for the next presentation, "Radiation Safety Aspects of I-125 Therapeutic Seeds Used as Markers in Breast Cancer Tumors" which describes an off-label use.

RADIATION SAFETY ASPECTS OF I-125 THERAPEUTIC SEEDS USED AS MARKERS IN BREAST CANCER TUMORS

Robert Gallaghar, State of Massachusetts, made a presentation regarding the regulatory issues encountered with the off-label use of I-125 radioactive seeds as markers to delineate tumors in breast cancer patients.

Mr. Gallaghar is the chair of Pilot Project 4 of the NRC's National Materials Program (NMP) He explained that Pilot Project 4 was one of 5 pilot projects within the NMP, and that its goal is to assist the Agreement States assume their responsibility for the development of licensing and inspection guidance for the new use of radioactive material not previously reviewed and approved. The recent use of I-125 seeds as markers in breast cancer tumors is an example of such a use.

Mr. Gallaghar then discussed the genesis of I-125 seeds as markers, and explained that the use of these seeds in this manner is a new use, and therefore, not regulated in NRC's regulations. As the discussion ensued, it was noted that the greatest foreseeable risk regarding this procedure is the inadvertent damage that could be inflicted on these seeds by an electric scalpel.

Mr. Gallaghar informed the ACMUI that the Pilot Project 4 Working Group is creating guidance for the use of these seeds in this manner. Thomas Essig, NRC, asked the ACMUI if it had any specific input toward the guidance. The ACMUI believed it would more appropriate for them to first review the research protocol that demonstrates the specifics of how these seeds are being used.

ACMUI Recommendation: That the ACMUI be provided with a copy of the research protocol for review, before making recommendations on guidance regarding the use of I-125 seeds as markers in breast tumors.

STAFF FINDINGS IN THE DOSE RECONSTRUCTION EFFORT INVOLVING THE ST. JOSEPH MERCY HOSPITAL CASE

Sami Sherbini, PhD, NRC, made a presentation regarding the NRC staff response to the ACMUI's recommendations related to the staff's method of reconstructing doses in the St. Joseph Mercy Hospital case.

Dr. Sherbini explained that, as a result of letters sent to the Commission by the Society of Nuclear Medicine (SNM), the Commission directed NRC staff to engage the ACMUI to perform an evaluation of the NRC's method of dose reconstruction. Included in that review was scrutiny of the SNM's statement that the NRC had greatly overestimated the dose the member of the public received in the St. Joseph Mercy Hospital case.

In response to the Commission's direction, NRC headquarters staff thoroughly reviewed the NRC Region III's dose reconstruction efforts, as well as the ACMUI's evaluation of the case. After review of all these efforts, the NRC headquarters staff concluded that NRC Region III's dose estimate of 15 rem was the most probable estimate of dose received by the member of the public in the St. Joseph case.

The ACMUI commented that it should have been given an opportunity to review the NRC staff's conclusion before it was posted to the NRC website.

ACTION ITEM: That the NRC staff provide the ACMUI a copy of the staff's conclusion of its dose reconstruction effort. (ITEM CLOSED).

STATUS OF MEDICAL EVENTS

Thomas Essig, NRC; Linda Gersey, NRC, and Donna-Beth Howe, PhD, NRC, presented this topic to the ACMUI. Mr. Essig began the discussion. He explained that this will be a standing agenda item for discussion at every meeting, as a result of Commission direction that the ACMUI should provide staff with feedback and recommendations to help identify trends and reduce the occurrence of medical events. The staff will provide the ACMUI with lists of events of concern, and will solicit specific feedback from the committee.

Linda Gersey provided ACMUI with the following list of events:

- Several instances where patients received therapeutic doses instead of the prescribed diagnostic doses
- Non-registration of certain devices that have been involved in medical events
  -MICK applicator
  -ReadiStrand

ACTION ITEM: The ACMUI should review the medical events and provide feedback on the events by December 2, 2004.

Donna-Beth Howe, PhD, informed the committee that 35 medical events occurred in Fiscal Year 2004. Several of the events involved catheters that developed "kinks" which prevented the radioactive seed from traveling to the desired treatment area.

Ralph Lieto, ACMUI, suggested that ACMUI be allowed to review lists of events that are related to medical events, but are not themselves medical events. (For instance, on occasion, medical byproduct material is involved in transportation incidents.) Mr. Lieto affirmed that he would be willing to spearhead the gathering of data on events related to medical events, and would also be willing to serve on a subcommittee to review medical event trending.

ACTION ITEM: **Ralph Lieto, ACMUI, will search the NRC's Nuclear Materials Events Database for events related to medical events, and provide feedback that will help structure the ACMUI's review of medical events, and will also participate in an ACMUI subcommittee to review medical event trending.**

UPDATE TO MEDICAL EVENTS CRITERIA DEFINITION

Ronald Zelac, PhD, NRC, presented this topic. After a brief definition of medical events, Dr. Zelac explained that the Commission directed the staff to provide recommendations on the appropriateness of the current definition as stated in 10 CFR 35. The Commission further directed the staff to confirm, for each modality, that there is an appropriate basis for the plus or minus 20 percent dose variation threshold, and to involve the ACMUI in any recommended changes.

Some committee members believed that the 20% threshold is acceptable, although at least one member believed that it may not be entirely appropriate when applied to medical events involving brachytherapy. The committee also expressed its opinion that the agency may be overzealous regarding enforcement action against licensees whenever the 20% threshold is exceeded. However, NRC staff clarified that a medical event created by the licensee administering a dose that is above or below 20% of that prescribed, does not automatically result in enforcement action against the licensee.

ACTION ITEM: **The ACMUI will form a subcommittee to more closely review the 20% dose threshold, as applied to medical events. The subcommittee will include Mr. Lieto and Drs. Nag, Diamond, and Williamson, with Dr. Williamson serving as Chair.**

ACTION ITEM: **NRC staff will provide pertinent data for the subcommittee to begins its work (e.g., background data on the genesis of the 20% threshold). Furthermore, NRC will provide a staff member to act as liaison to the subcommittee.**

THURSDAY, OCTOBER 13, 2004

DRAFT FINAL 10 CFR 35 T&E: STATUS OF RULEMAKING

Roger Broseus, PhD, NRC, gave an update on this topic. Dr. Broseus briefed the ACMUI with the status of the training and experience (T&E) draft final rule, which proposes the addition of specified training hours to the T&E in order for a person to obtain Authorized Nuclear Pharmacist (ANP) status or Authorized User (AU) status. Dr. Broseus informed the committee that the formal end date for the comment period on the draft final rule is October 18, 2004.

The committee spent time discussing the tenor of the comments they would like to make

regarding the draft rule. Generally, there was concern regarding the connection between the alternate and the board certification pathway to AU status. The ACMUI stated that the alternate training pathway affects the board certification pathway, although they are supposed to be independent means of attaining AU status.

A related concern was the proposed hours of training a candidate would have to undergo to become a qualified AU. Several committee members expressed their belief that the staff's proposal of 200 hours of training toward the didactic training aspect of the 10 CFR 35.390 alternate pathway to AU status was excessive. All of the ACMUI, with the Agreement State member abstaining, believed that 80 hours of didactic training was sufficient.

ACTION ITEM: The NRC staff will obtain the Commission's permission to publish a redline/strikeout copy of the draft final rule to the NRC website.

ACMUI Recommendations:

1. **That the number of didactic hours of training in the draft final 10 CFR 35.390 be reduced from 200 to 80, with the total number of hours of training under 35.390 remaining at 700 hours. This motion passed with one abstention.**

2. **That the draft language in 10 CFR 35.57 be modified to read as follows: That physicists who have been authorized to serve the function of authorized medical physicists for high dose rate brachytherapy, gamma stereotactic radiosurgery, and teletherapy be grandfathered to be allowed to serve as authorized medical physicists for those respective modalities**.

3. **That the staff move toward implementing the draft final 10 CFR 35, except for those items of concern (for which the committee has made recommendations above) the ACMUI has brought forward.**

PROPOSED CHANGES TO ABNORMAL OCCURRENCE CRITERIA

Andrea Jones, NRC, presented proposed changes staff has made to the medical event Abnormal Occurrence criteria. The purpose of the proposed changes is to create criteria that capture events of true safety significance. These changes include:

- The addition of the phrase "unintended permanent functional damage"
- The addition of the term "tissue" to capture events where there was significant tissue damage
- Language that captures events whereby a written directive was required, but one was not prepared

The ACMUI asked the staff to consider the following:

- Amending the criteria to express dose in terms of rem instead of rad, to properly characterize exposures that involve radiation other than gamma and beta.
- Add language that captures events that occur in the medical arena, but are not "medical events," as that term is defined in 10 CFR 35.

ACMUI Recommendation: That the staff move forward with the criteria as proposed, with the suggested changes that dose be expressed in "rem" rather than "rad", and the criteria includes language that captures events that involve the medical administration of byproduct material.

ICRP 2005 RECOMMENDATIONS

Richard Vetter, PhD, ACMUI, lead the discussion on this topic. During this discussion, Dr. Vetter briefed the ACMUI on the International Commission on Radiological Protection's (ICRP) recommendations for 2005. Dr. Vetter sought an ACMUI consensus position on the 2005 recommendations, for presentation to the ACNW Working Group discussion on October 19, 2004.

Highlights of Dr. Vetter's discussion include the following points

- The ICRP intends that their recommendations influence regulatory agencies and management bodies
- ICRP recommendations define safety culture
- ICRP principles of protection require restrictions on dose, which they term "constraints"
- Exposures must be controlled.
  - The government must justify all exposures to the public that are non-medical exposures.
  - The medical profession must justify treatment to patients, by demonstrating that the treatment does more good than harm

Classes of exposure are categorized by the various groups who may encounter exposures. These groups are occupational workers, patients of medical treatments, and members of the public. Each class of exposure is assigned a dose constraint, that either the government or the medical profession should justify.

Regarding occupational radiation workers, Dr. Vetter stated that the ICRP recommended that pregnant radiation workers' limit of exposure be reduced to 100 millirem, from the current 500 millirem. This generated much discussion amongst ACMUI members, who did not agree with this proposal.

ACMUI Recommendation: That the ICRP maintain in its recommendations the current occupational exposure of 500 millirem to pregnant occupational workers.

ADMINISTRATIVE CLOSING

Angela McIntosh, NRC, lead the discussion on this topic. During this discussion, the NRC staff and the ACMUI the recommendations arising from this meeting, and discussed proposed meeting dates for the Spring 2005 meeting.

First, Ms. McIntosh reviewed the recommendations from the October 13-14, 2004 meeting. Next, Ms. McIntosh discussed the dates to hold the Spring 2005 ACMUI public meeting. The ACMUI and NRC staff set the proposed meeting dates for April 11-13, 2005; with alternate dates of April 20-22, 2005.

The meeting was adjourned at 3:20 p.m.

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