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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON THE MEDICAL USE OF ISOTOPES

5 (ACMUI)

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7 TUESDAY,

8 OCTOBER 20, 2009

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10 ROCKVILLE, MARYLAND

11 The Committee convened in Room EBB01-13/15 at

12 the Executive Boulevard Building, 6003 Executive

13 Boulevard at 8:00 a.m., Leon Malmud, Chairman,

14 presiding.

15 COMMITTEE MEMBERS:

16 LEON MALMUD, M.D., Chairman

17 BRUCE THOMADSEN, Ph.D., Vice Chair

18 DOUGLAS EGGLI, M.D.

19 DARRELL FISHER, Ph.D.

20 DEBBIE GILLEY

21 SUE LANGHORST, Ph.D.

22 STEVE MATTMULLER, MS, Rph, BCNP

23 ORHAN SULEIMAN, Ph.D.

24 WILLIAM VAN DECKER, M.D.

25 JAMES WELSH, M.D.

1

2 CONSULTANT TO THE COMMITTEE:

3 MILTON GUIBERTEAU, M.D.

4

5 NRC STAF:

6 CHARLES MILLER, PH.D.

7 ROB LEWIS

8 JIM LUEHMAN

9 CHRIS EINBERG, Designated Federal Official

10 CINDY FLANNERY, Alt. Designated Federal Official

11 ASHLEY COCKERHAM

12 NEELAM BHALLA

13 SANDRA GABRIEL

14 MERRI HORN

15 DONNA-BETH HOWE, PH.D.

16 JENNIFER RAND

17 GRETCHEN RIVERA-CAPELLA

18 GLENDA VILLAMAR

19 JENNY WEIL

20 RONALD ZELAC, PH.D. (via telephone)

21

22 MEMBERS OF THE PUBLIC:

23 CURTIS ANDERSON

24 DAVID BURTON

25 JOHN CREASY

1 MEMBERS OF THE PUBLIC: (cont'd)
2 LYNNE FAIROBENT
3 KAREN LANGLEY (via telephone)
4 MELISSA MARTIN
5 RICHARD MARTIN
6 ROBERT MASSEY
7 EIPING QUANG
8 GLORIA ROMANELLI
9 IRA SCHNEIDER (via telephone)
10
11 A G E N D A

25

1

2 P R O C E E D I N G S

3 (8:03:06 a.m.)

4 CHAIR MALMUD: Good morning, everyone, and
5 welcome to the second day of session. The program
6 today begins with a presentation on New Security
7 Regulations by Ms. Horn, who will provide an overview
8 of the new regulations under 10 CFR Part 37. When you
9 speak, please introduce yourself so that the court
10 stenographer may attribute your words of wisdom to
11 yourselves. Thank you. Good morning.

12 MS. HORN: Good morning. My name is Merri
13 Horn. I'm a Senior Project Manager in the Division of
14 Intergovernmental Liaison and Rulemaking in FSME. I'm
15 the overall Project Manager for the Part 37, though I
16 am not the only person working on that. We actually
17 have a very large group. There are several NRC
18 people, as well as a lot of state people that are
19 working on this effort.

20 Because the proposed rule is pre-
21 decisional, I cannot go into a lot of detail on the
22 provisions, or into the reasons of the provisions.
23 However, because we have posted preliminary rule
24 language for public comment, some of the aspects of
25 the proposal are already publicly available, so from

1 that standpoint we can certainly provide information.
2
3 The primary objective of this rulemaking
4 is to provide reasonable assurance in preventing the
5 theft or diversion of Category 1 and Category 2
6 quantities of radioactive material.
7 CHAIR MALMUD: Excuse me. I'm just
8 greeting members of the public. Good morning.
9 Welcome to the meeting. Would the members of the
10 public who are on the call please introduce
11 yourselves.
12 MS. LANGLEY: Karen Langley, University of
13 Utah.
14 THE WITNESS: Thank you.
15 MR. BULLOCK: This is Ronald Bullock.
16 CHAIR MALMUD: Thank you. Good morning.
17 And I'm sorry for interrupting.
18 MS. HORN: No problem. In developing this
19 proposed rule, we considered the various security
20 orders that were issued to the licensees, lessons
21 learned from implementation of the orders, and doing
22 the inspection against the orders, recommendations
23 from the Independent Review Panel, and the Materials
24 Working Group, and a petition of rulemaking filed by
25 the State of Washington related to transportation

1 issues.

2 We also considered stakeholder input
3 received on the technical basis for transportation
4 security. There were several public meetings on that,
5 I believe January `08 time frame. And they also
6 issued it for public comment. And we also considered
7 the input that was received on the preliminary rule
8 language that was posted for public comment.

9 The proposed rule would create a new Part
10 37. This part would contain the security requirements
11 for Category 1 and Category 2 quantities of
12 radioactive materials. It would also contain security
13 requirements for the transportation of small
14 quantities of irradiated fuel, basically, less than
15 100 grams.

16 We created this new part, because we felt
17 it would be easier to use, the requirements would be
18 easier to find for both the licensee, and for the
19 public that may have interest in it. If we
20 intersperse them in Part 73 with the Reactor Security
21 Requirements, and the Fuel Cycle Requirements, it
22 would have been very complicated, because you've got
23 what applies. We could have put them in various
24 places in the Part 30, but, again, we thought it would
25 be easier if they were all in one place, and ease of

1 use is a very definite benefit. We're also making
2 conforming changes to other parts of the Code of
3 Federal Regulations, so you'll find pointers, like in
4 Part 30, Part 35, Part 34, that point you to the
5 requirements in Part 37.
6 The major provisions are contained in
7 three subparts. Subpart B contains requirements for
8 the Access Authorization Program. Subpart C contains
9 requirements for the Security Program during use, and
10 Subpart D contains Transportation Security provisions.
11 Kind of in a nutshell, I'm just going to give you the
12 highlights of each of the subparts.
13 The Access Authorization program requires
14 that anyone with unescorted access to Category 1, or
15 Category 2 quantities of radioactive material undergo
16 a background investigation that includes
17 fingerprinting, a criminal history records check,
18 along with several other elements that are listed in
19 the rule. Licensees would be required to have
20 procedures to implement the program. That's a little
21 bit different. They weren't required by the orders.
22 They will be required to protect the information
23 obtained during the investigation, and to keep various
24 records.
25 There are several categories of

1 individuals that would be relieved from the
2 fingerprinting and other aspects of the background
3 investigation. The licensee would still have to make
4 a determination on whether they should have access to
5 the material, or not. It doesn't grant you access, it
6 just means you don't have to do the background
7 investigation portions. As part of this, reviewing
8 officials would need to be fingerprinted under the
9 rule.
10 The Security Program, during use, would
11 require the development of a security plan, so you
12 would actually have to develop an actual written
13 security plan that would need to be approved by
14 various individuals in your organizations. The
15 licensees would be required to coordinate with local
16 law enforcement agencies that would provide response
17 to any threat to the facilities. Licensees would be
18 required to have procedures, conduct training, and
19 keep records.
20 Again, the orders did not actually require
21 the development of procedures and training. I suspect
22 that most likely you did that, because how else would
23 you implement them, but the rule actually will require
24 that now. Licensees would be required to establish
25 security zones around the material, and to monitor and

1 detect unauthorized entry into the zone. This could
2 be as simple as having -- when you're using the
3 material, having someone in the area. It could be
4 direct surveillance, that person would prevent anyone
5 from getting into whatever zone that you've
6 established. Licensees would be required to respond to
7 any theft, sabotage, or diversion of material.
8 The Transportation Security Program would
9 include verification of license authorization when
10 transferring Category 1 quantities of radioactive
11 material. This would mean that you would need to call
12 whatever agency issued the license, and check is this
13 a valid license? Are they authorized to receive this
14 material? And it would be a simple yes or no. It's
15 not an approval from the licensing agency, but just a
16 verification that whoever you're sending the material,
17 is actually authorized to receive it.
18 Licensees would be required to conduct
19 preplanning and coordination activities with the
20 receiving licensee. And in the case of Category 1
21 shipments, with state officials.
22 For Category 1 shipments, advance
23 notifications to the states and NRC would be required.
24 Licensees would be required to maintain constant
25 control and surveillance during transit, and to have

1 communication capabilities to summon assistance for
2 shipments. These are very similar to what was in the
3 orders.
4 For Category 1 shipments, movement control
5 centers, and telemetric position monitoring would be
6 required, as well as procedures and training. You
7 wouldn't have to use GPS. You could use some other
8 type of system, but GPS would meet the requirements
9 for this.
10 Kind of our time line. The preliminary
11 rule language was posted for public comment in the
12 fall and spring. The Transportation was, I believe,
13 posted in November, and the others were in the April-
14 May time frame. We considered the comments in
15 finalizing the proposed rule language.
16 The proposed rule is due to the Commission
17 this fall, sometime probably in early December. If
18 approved by the Commission, the proposed rule will be
19 published for public comments. We can't predict how
20 long it will take the Commission to approve the rule,
21 or whether they will. That's always hard to tell. We
22 are proposing an extended comment period, 120 days
23 versus our normal 75 days. We felt that this was a
24 fairly large rule. It's actually three rules
25 combined, when you get right down to it. And it's

1 fairly complex, so we're giving more time. I will note
2 that since we are planning to give more time, we are
3 unlikely to entertain any requests for an extension,
4 so the 120 days will be the comment period.
5 We are planning to develop guidance
6 documents, and those will be available for public
7 comment during the comment period on the proposed
8 rule, because, as everyone knows, the details is
9 really when you go to implement, so the guidance will
10 have more of that type of information.
11 We are currently planning to hold at least
12 one workshop on the guidance. I don't know when, or
13 where that will be, but it will be during the comment
14 period on the proposed rule. And then the final rule
15 will be due to the Commission about a year after
16 publication of the proposed rule. And that will
17 somewhat depend on the number of comments that we
18 receive, and various things. If there's few comments,
19 which I don't think there will be in this case, we
20 will get it up sooner, about a year. And then after
21 the Commission -- assuming the Commission approves the
22 final rule, we're suggesting a 180-day implementation
23 date after the final rule is published.
24 With that, I would entertain any
25 questions.

1 CHAIR MALMUD: Thank you, Ms. Horn. Are
2 there any questions, or comments?
3 MR. MATTMULLER: Steve Mattmuller. In
4 previous discussions on security, we've talked about
5 the sources used in blood irradiators in chem labs,
6 but with irradiated fuel, when it says less than 100
7 grams, is that referring just to the Uranium content,
8 and/or could you give examples?
9 MS. HORN: It is the Uranium content.
10 That would be irradiated fuel. That's just for the
11 transportation aspects of it. When we looked at the
12 regulations, we realized that we had a slight gap. We
13 had requirements for shipping irradiated -- large
14 quantities of irradiated fuel, but there was actually
15 a small gap at 100 grams and less, that we didn't have
16 requirements, so this is filling that gap.
17 MR. MATTMULLER: And would these by,
18 typically, the fuel from a research reactor?
19 MS. HORN: You know, to be honest, I'm not
20 sure. I think a research reactor would probably be
21 higher than that.
22 MR. LEWIS: Yes. It's, typically,
23 individual things that are sent for analysis at a
24 place like Vallecitos, or some -
25 MS. HORN: It's a very small quantity.

1 There's also an activity limitation.

2 CHAIR MALMUD: Any other questions, or

3 comments?

4 MEMBER LANGHORST: Sue Langhorst. Merri,

5 I was really impressed with how it call came together.

6 I know you guys had three working groups on that, and

7 covered -- I think you guys did well in meshing it all

8 together.

9 My predecessor, Dr. Vetter, had commented

10 on one missing part, which was the service providers.

11 And that was a very important piece to us.

12 MS. HORN: We actually felt that that was

13 covered, because there was already a provision in

14 there that you could transfer the approval from one --

15 the background investigation information from one

16 licensee to another. But we originally felt that

17 would cover it, but we are -- we did go back, and we

18 are actually adding that provision.

19 MEMBER LANGHORST: Okay.

20 MS. HORN: Make it very clear.

21 MEMBER LANGHORST: Yes, that does not

22 cover it.

23 MS. HORN: Actually, I think that it

24 would, but we're making it explicitly clear that that

25 is provided for.

1 MEMBER LANGHORST: And a second question I
2 have, one of the things that I pointed out in my
3 comments to you all was, there was a 60-day provision
4 of your background investigation documents had to be -
5 - couldn't be older than that to make your
6 determination. But, yet, you could send background
7 documentation to other licensees, and it would be much
8 older than that, and they could use that. So, I was
9 confused.
10 MS. HORN: It was intended to be that the
11 initial approval of somebody, that the information
12 would only be valid for that long. We're actually
13 taking another look at that. We received several
14 comments in that area.
15 MEMBER LANGHORST: Yes.
16 MS. HORN: And I'm not sure what the final
17 outcome will be, but we are taking another look at
18 that.
19 MEMBER LANGHORST: That would be near
20 impossible for us, for many people.
21 MS. HORN: Yes, you don't want someone to
22 rely on information that's a year old in granting
23 someone -
24 MEMBER LANGHORST: Right. But under our
25 experience, when we had to go to a lot of different

states, if a person has lived in a lot of different states, some states are better than others in responding to us. And that has been a frustration on our part, that we can't get our people through, because we don't hear back from these entities. And it's not really clear how much we have to document the effort we take to show that yes, we did try to get that information. So, that would be a very important piece in the guidance documents.

MS. HORN: We are looking at them, like I said. We had actually received comments on the preliminary, so we actually extended it from what it was in the preliminary rule language. And we are taking a second look at that, actually, a third look at that.

MEMBER LANGHORST: Okay. Thank you very much.

CHAIR MALMUD: Dr. Howe.

DR. HOWE: I'd like to point out that normally when you think about Uranium, you're thinking about fuel, but Uranium targets to make Moly would be captured probably in the under 100 grams. So, I think you need to keep that in mind. I don't know if your rule says specifically fuel, or it says under 100 grams.

MS. HORN: It says irradiated fuel.

DR. HOWE: Okay. You probably ought to consider that there are other irradiated Uraniums.

CHAIR MALMUD: Other comments, or questions?

MEMBER GILLEY: Merri, will this be a Compatibility B for the agreement states? And what is the implementation date for the agreement states?

MS. HORN: The easy question first. It will be the normal three-year implementation period. That's what we're suggesting. The Commission could decide other. I don't think they will, because the orders are out there, and would stay in place until various states got their requirements in place.

The rule has various compatibilities. I think it's a four-page table that's in the Federal Register Notice that outlines the compatibilities for each section and subsection. The large majority -- there's a large majority of them are probably B, but there are a few Cs in there, and there's even, I believe, a couple of Ds, some of the record keeping things. But the main requirements are mostly B.

MEMBER GILLEY: One of the issues with the agreement states, of course, is doing the background check on the reviewing official, and the access of

1 that reviewing official to the actual material,
2 unauthorized access. I'd just like to bring that up
3 for the record.
4 MS. HORN: Yes. No, we're very aware that
5 that is a major issue with the states.
6 CHAIR MALMUD: Thank you. Other comments
7 or questions?
8 VICE CHAIR THOMADSEN: Thomadsen. The
9 qualifications for the reviewing person, do they have
10 to be an authorized user now, under the rule?
11 MS. HORN: We want the reviewing official
12 to be fingerprinted, and the mechanism by which we can
13 do that, if they have to have authorization to
14 material, because that's the way the Energy Policy Act
15 is written. In reality, if you didn't want to give
16 them -- I mean, if it was an HR person, you could
17 probably work around that a little bit. But, in
18 reality, yes, we are requiring then that they would be
19 permitted to have authorization to the material,
20 because that's our mechanism to different
21 fingerprinting.
22 VICE CHAIR THOMADSEN: At our facility,
23 the University of Wisconsin, in order to have
24 authorization to have access to material, you have to
25 explicitly say what your protocol is that you're going

1 to be doing, and which material it is. I'm not sure
2 the mechanism you could use to authorize this person
3 as a user, when they aren't going to be using.
4 MS. HORN: We recognize that this is an
5 issue, and in the Federal Register in the proposed
6 rule, we're actually specifically inviting comment on
7 this issue, so we encourage you to comment on that
8 aspect.
9 CHAIR MALMUD: Sue.
10 MEMBER LANGHORST: Sue Langhorst. Dr.
11 Thomadsen reminded me of a question that I had, too.
12 For Gamma Knives, one question I submitted was whether
13 the Gamma Knife, itself, could be considered as the -
14 I forget the term now - the area. What is the?
15 MS. HORN: Oh, the security zone.
16 MEMBER LANGHORST: The security zone. If
17 the unit, itself, could be considered the security
18 zone, because of the difficulty of getting into it, to
19 the sources.
20 MS. HORN: That would be an implementation
21 issue. I'm inclined to say no, but I'm not familiar
22 enough with the Gamma Knife. Medical isn't an area
23 that I'm real familiar with.
24 MEMBER LANGHORST: Right. So that was a
25 question that I submitted, and that would make things

1 easier, too, and still give the level of security that
2 you all are looking for.
3 MS. HORN: Those are the types of things
4 that will be addressed in the guidance.
5 MEMBER LANGHORST: Thank you.
6 CHAIR MALMUD: Any other questions, or
7 comments? Questions from the public? If not, we'll
8 move ahead to the next item on the agenda.
9 DR. HOWE: Thank you, Merri.
10 CHAIR MALMUD: We're a bit ahead of the
11 schedule. Dr. Howe will do the next presentation on
12 the Potential Changes to 10 CFR Part 35, and seek
13 Committee advice. Dr. Howe.
14 DR. HOWE: Thank you, Dr. Malmud. I never
15 know whether mine is going to be ahead of schedule, or
16 way behind. It depends on the interest level.
17 At our last meeting, we brought up an
18 issue about training and experience provided in the
19 35.400 and 600 use of materials at medical
20 institutions. And what I'd like to do is, the first
21 three slides that I'm presenting are really a summary
22 of what happened at the last ACMUI meeting. So, what
23 I'd like to have you do is just take a few minutes and
24 review those first three slides. And then if you look
25 up when you're done, I'll know.

1 Okay. It looks like most people have
2 finished. Essentially, the question we brought to you
3 in the last ACMUI meeting was whether the use of the
4 word "medical institution" in the training experience
5 for 400 and 600 was too limiting. And the ACMUI
6 decided that it was, and recommended adding clinic,
7 but not private practice.
8 We're bringing a different question back
9 to you now. And the question we're bringing to you
10 now is, do we even need to use the term "medical
11 institution" in Part 35? It only appears in four
12 places, the definition of 35.2, the training and
13 experience requirements in 35.490, 491, and 690. It's
14 on slide -
15 CHAIR MALMUD: Dr. Suleiman.
16 MEMBER SULEIMAN: Do you have a more
17 formal definition of the term "medical institution"?
18 DR. HOWE: We have a definition in 35.2.
19 And in 35.2, it is a place that has two or more
20 medical specialties. We've had confusion on how to
21 interpret that, whether it meant you had to have two
22 different radiation specialities, or you just had two
23 different medical specialities. At NRC, we're a
24 little bit more liberal on reviewing it. In agreement
25 states, they may be a little bit more conservative on

1 what that definition is.

2 MEMBER GILLEY: I don't think it's -

3 (Off mic comment.)

4 CHAIR MALMUD: Is the stenographer able to

5 hear that?

6 MEMBER GILLEY: I'm sorry.

7 CHAIR MALMUD: Could you please repeat

8 that, please.

9 MEMBER GILLEY: Debbie Gilley. Many of

10 the agreement states have a different definition for

11 medical institution, because it is not a Compatibility

12 B issue. I believe it's a Compatibility D, but I'd

13 have to verify that.

14 DR. HOWE: Yes. So, we took the question

15 back, and we looked at it, and we talked about. We

16 said do we even need the definition of a medical

17 institution? It only appears in these places. You've

18 opened the training and experience requirements to a

19 medical institution, plus a clinical practice. You

20 did specifically exclude private practice, so keep

21 that in mind. So, we thought that -- the question we

22 bring to you today is, would it be acceptable to take

23 out medical institution all together, and I gave you

24 an example of that in the next slide, which shows that

25 35.490(b)(1)(ii), instead of reading, "Would 500 hours

1 of work experience under the supervision of an
2 authorized user meet the requirements in 35.490, or
3 equivalent agreement state requirements at a medical
4 institution?" And you had agreed to add, "or clinic
5 involving", and then you continue with the regulation.
6 We would just drop out the "at the medical
7 institution or clinic", at the end. So, it would just
8 say that 500 hours of work experience under the
9 supervision of an authorized user who meets the
10 requirements in 35.490, or equivalent agreement state
11 requirements.
12 Now, you'll note that we have modified
13 this language in your Draft Final Rule, so that you
14 don't have to meet requirements in 490, which tied you
15 to the rule after 2002, but that you were an
16 authorized user. So, we opened that up a bit. But
17 the idea is, do we need to even specify where you
18 receive this supervised work experience?
19 CHAIR MALMUD: I see some anxiety among
20 members. Dr. Suleiman?
21 MEMBER SULEIMAN: Yes. Again, some very
22 specific questions. Does this work experience imply
23 with humans, or it could be training on the equipment?
24 And, if that's the case, could that training be
25 considered work experience if they're at the

1 manufacturer's facility, which is not a medical
2 institution, and they're getting trained? Now, if the
3 answer to the first question involves human use, then
4 forget the second question.
5 DR. HOWE: Okay. Just to clarify, if I
6 use 35.490 as an example, the experience -- "the
7 supervised work experience is ordering, receiving, and
8 unpacking radioactive materials safely, and performing
9 the related radiation surveys, checking survey meters
10 for proper operation, preparing, implanting, or
11 removing brachytherapy sources, maintaining running
12 inventories of material on hand, using administrative
13 controls to prevent a medical event involving the use
14 of byproduct material." It doesn't specifically say
15 human use, but the implication, and how we've
16 interpreted it is, this is actual patient -
17 MR. EINBERG: Dr. Malmud?
18 CHAIR MALMUD: Chris.
19 MR. EINBERG: May I interrupt here? I
20 hate to interrupt this good discussion here, but we
21 have Dr. Miller here, who like to make a presentation.
22 And he's on a very tight schedule right now. Could
23 we take a few minute break from this discussion?
24 CHAIR MALMUD: Certainly. Thank you.
25 DR. MILLER: As has become the custom, I

1 like to come over for presentation of certificate of
2 appreciate for members who are going to be leaving the
3 Committee. And the honoree today is Dr. Eggli. So,
4 if I could ask him to come up. Before I present him
5 the certificate, I wanted to read a few of his
6 accomplishments.
7 As a Nuclear Medicine Physician on ACMUI,
8 he's been with the Committee since 2003. He's aided
9 NRC by reviewing and commenting on rulemaking and
10 guidance documents for nuclear medicine. He served on
11 numerous subcommittees, the New Modality Subcommittee,
12 the Dose Reconstruction Subcommittee, and Chairing the
13 Board Certification Pathway for ABR Diplomats
14 Subcommittee. And I've always thought of Dr. Eggli as
15 the training guru on the Committee.
16 (Laughter.)
17 DR. MILLER: If I could just read the
18 certificate, so the recorder can hear it. "This is a
19 Certificate of Appreciation presented to Douglas F.
20 Eggli, M.D., in recognition for your service as a
21 member of the Advisory Committee on the Medical Use of
22 Isotopes, which resulted in a significant improvement
23 in the Nuclear Regulatory Commission's understanding
24 and use of byproduct material in medicine." And it's
25 dated October 2nd, 2009, and signed by Chairman

1 Jaczko.

2 (Applause.)

3 DR. MILLER: I'll get of the way, and let

4 you finish this good discussion.

5 CHAIR MALMUD: Thank you, Dr. Miller.

6 Thank you, Dr. Eggli. We were discussing the proposed

7 change in the terms. And there was concern about

8 whether this included working with patients, as

9 opposed to without patients, as opposed to animal

10 research. And Dr. Howe was answering the question by

11 reading the definition. We're at that point now.

12 DR. HOWE: And I think if you took a very

13 liberal interpretation of this, all of this could be

14 done without a person involved. So, your point might

15 be that we would have to tighten this up to make sure

16 that we're talking about patient-related -

17 CHAIR MALMUD: May I suggest, if the

18 existing term, "at a medical institution", be replaced

19 by "medical provider, with a medical provider". The

20 same problem occurred a while ago with JCAHO, when

21 there was a Joint Commission for the Accreditation of

22 Hospitals, and they realized that they had more to

23 inspect than just hospitals, so they used -- expanded

24 the term to be other organizations. But it's only a

25 suggestion. I'd be happy to hear better suggestions,

1 by all means.

2 DR. GUIBERTEAU: Mickey Guiberteau. I

3 think one of the -- I'm having a little bit of

4 difficulty understanding the intent of even putting a

5 medical institution in the rule. The reason for that

6 is, one of the objections to private practice is that

7 the term is, I guess at best ambiguous, and at worst

8 meaningless, because it applies to multiple settings,

9 including institutional settings.

10 I think if the intent of a medical

11 institution is to reflect the quality of the training,

12 I don't believe that's necessarily the case. And that

13 since it's required to be under an authorized user who

14 meets the similar requirements, it seems to me that

15 the burden is on the authorized user.

16 I do, also, believe that the term

17 "provider" in most of CMS' sense, and one of the

18 things that most physicians object to is that it's

19 applied to physicians, in general, that we are medical

20 providers. And that, also, would really go back to

21 the authorized user. I don't believe the term

22 "provider" really is specific enough to cover all of

23 the things that you might intend, given the fact that

24 it's been in use for so long by CMS to refer to

25 physicians.

1 DR. HOWE: Just a point of clarification.
2 The reason that medical institution is in here is a
3 long historical reason, so one of the things I
4 presented at the last meeting was that medical
5 practice has changed. When medical institutions were
6 put in as part of the requirements, probably back in
7 the `60s, that was to insure that you were getting
8 your training for these more complicated things at
9 hospitals, because you didn't have individual
10 standalone clinics. So, that's why it's in there now,
11 and that's why we're questioning whether in today's
12 climate of medical care it is still appropriate to use
13 that term.
14 DR. GUIBERTEAU: May I respond?
15 CHAIR MALMUD: Please, do.
16 DR. HOWE: And so your arguments
17 essentially support -
18 DR. GUIBERTEAU: Well, my feeling is,
19 you're going in the right direction by suggesting it
20 be taken out, because I think any other definition
21 would also be imprecise, and not inclusive.
22 I feel very strongly, being involved in a
23 lot of training issues, that the burden is really on
24 the authorized user providing the training, because
25 medical institutions include a huge variety of

1 institutions and clinics that are subsets of
2 institutions. I think that's very difficult, so I
3 think the burden -- if you leave that out, then you're
4 back to the authorized user, who is really the person
5 who is providing the training.
6 CHAIR MALMUD: Dr. Thomadsen.
7 VICE CHAIR THOMADSEN: In 35.51(a)(2)(ii),
8 you use the term "clinical radiation facilities". And
9 it seems like that could cover all that we want it to.
10 DR. HOWE: That's a good suggestion.
11 VICE CHAIR THOMADSEN: It wasn't mine,
12 really.
13 (Laughter.)
14 CHAIR MALMUD: Dr. Thomadsen, you made the
15 suggestion, however. We'll credit you with it. Let
16 me explain what one of my concerns is.
17 Human nature doesn't change, regulations
18 change. In the first decade of the 20th century,
19 Abraham Flexner inspected American medical schools,
20 recommended the closure of a good number. Physicians
21 then were willing to sign documents that they had
22 trained physicians in training, and it turned -- it
23 became evident that the basis for signing the
24 documents was an exchange of funds, rather than
25 genuine training.

1 There's a certain cynicism which I don't
2 wish to adopt, but there's a certain reality, which we
3 have to be faced with, as well. And when an
4 individual is given that authority, in the absence of
5 any oversight, let us say at a single office, one runs
6 the risk of that occurring again. And, therefore,
7 having this occur in an institution in which there is
8 some oversight by at least one other party, and we've
9 seen examples of this in practice, where the physicist
10 is an important component with the radiation
11 oncologist, et cetera, I think it behooves us in our
12 protection of the public to be assured that we're not
13 unleashing the possibility that that which happened
14 before the first decade in the 20th century, doesn't
15 recur in the first decade of the 21st century.
16 DR. HOWE: And I know what you're
17 expressing was a primary concern to the medical group
18 in the `80s, before more people did manual
19 brachytherapy, gamma knife, outside of hospitals. And
20 that was one reason they insisted it be medical
21 institution, so that they would have a group to give -
22
23 CHAIR MALMUD: I'm also concerned --
24 excuse me. I'm also concerned about the issue of
25 documentation. Is the individual authorized user

1 required to document those hours, so that there is a
2 possibility of review, and confirmation of those
3 hours, in the event that an untoward event occurs, and
4 the ability of the individual is challenged.
5 DR. HOWE: As the NRC training and
6 experience forms are set up right now, I believe that
7 the 500 hours of work experience, you have to identify
8 who the authorized user was, and you have to indicate
9 what license they're on. But the only individual that
10 has to sign the training and experience is the
11 preceptor. So, the authorized user providing the 500
12 hours of supervised work experience does not have to
13 sign, because the regulations don't say that he signs.
14 It just says it has to be provided by an authorized
15 user.
16 CHAIR MALMUD: Thank you. Is there anyone
17 else who has the same concern that I do with respect
18 to oversight and documentation? Dr. Suleiman.
19 MEMBER SULEIMAN: That was my intent, in
20 the first place. I was clearly looking at it from a
21 different perspective. I could see you would have
22 facility creep. You start to get away more and more
23 from human access, and somebody will be at some other
24 site where it's clearly not a clinical environment,
25 and very limited. And they'll say oh, we'll just put

1 the 40 hours you were here for the week, or whatever.
2 So, you slowly creep away.
3 And I've known individuals, I won't go
4 into any further detail, that say oh, that's not a
5 problem. We'll just document that this way, or that
6 way. But human nature being what it is, and that this
7 is formal training, I am concerned, because there are
8 loopholes here. And when you look at the broad
9 distribution, I -- let me say this, because I've said
10 it before, the people at this table, the people in
11 this room represent the cream of the crop, represent
12 the upper percentiles. When you get out into the real
13 world, you have a much broader distribution, and don't
14 forget about the fringes. So, it's that group that
15 you're addressing, and those are the people that will
16 find these loopholes, and take advantage of them. So,
17 I don't know whether that's real, or not. I don't
18 know what the experience of the NRC is reviewing the
19 authorized user documentation, but I've had too much
20 experience with human nature, and given the
21 opportunity for a large number of people, somebody
22 will take advantage of it.
23 CHAIR MALMUD: Dr. Eggli, you had a
24 comment. Thank you.
25 MEMBER EGGLI: My comment was I agree with

1 the concern about human nature. I'm not sure there's
2 an easy way to solve this particular question, because
3 the issue that, as when it came up originally, is that
4 some modality training, in fact, may have to be done
5 outside of the institutional setting, because the
6 institution may not offer the full spectrum of the
7 modalities, and they have associates who do.
8 I think if it's clear that, essentially,
9 the training achieved in a freestanding location is
10 still the responsibility of the preceptoring
11 institution/individual at the training institution,
12 that may be a solution to that, which is, essentially,
13 to make the -- if it's a residency training program,
14 to make the residency training program responsible for
15 the quality of training received at a freestanding
16 location, so that somehow it does devolve back to a
17 supervised program that isn't just one individual
18 signing a preceptor statement.
19 CHAIR MALMUD: Dr. Guiberteau. Oh, excuse
20 me.
21 DR. HOWE: Let me just make a quick
22 comment on that. This particular section, you are not
23 required to be in a residency program. So, this -
24 MEMBER EGGLI: Is this the alternate
25 pathway, effectively?

1 DR. HOWE: Well, it's in both, but it also
2 - the supervised work experience is not, necessarily,
3 tied into a residency program, so you don't have that
4 assurance that you are looking for, that it's tied to
5 a residency program. It can be given anywhere. Okay?
6 CHAIR MALMUD: Dr. Guiberteau.
7 DR. GUIBERTEAU: I agree with Dr. Malmud's
8 concerns. I do feel, however, that in the many
9 programs, both in diagnostic, and therapeutic
10 radiology with which I'm familiar, that the point that
11 Dr. Eggli is making is very important. I think that
12 if you require it to be in an institution, in many
13 cases this would disqualify training that's provided
14 in freestanding centers that are affiliated with an
15 institution, such as a medical school.
16 I also have concerns that in an
17 institution, that the definition of institution, as
18 was read, that it really doesn't provide you with any
19 guarantee of oversight at all. It just says more than
20 one medical specialty. Is that not correct? And we
21 don't know what those two might be, so they may, or
22 may not be related. But I do have the concern, and
23 I'm not sure how you would solve this, that rather
24 than requiring it be in a medical institution, that at
25 least that institution is affiliated with either some

1 kind of training program, or some kind of larger
2 entity, would be in the best interest of, I think, the
3 public safety. It, however, may limit many programs,
4 and many instances of those who are not in programs,
5 to obtain these new trainings.
6 CHAIR MALMUD: Other comments?
7 MS. FLANNERY: I just want to add that if
8 this section was removed from the section that Donna
9 Beth had described in 400 and 600, and what I mean is
10 the phrase, "requirements at a medical institution",
11 then those paragraphs would read the same as the
12 equivalent paragraphs for 200 and 300 uses. So, if
13 you look at the equivalent paragraphs discussing the
14 supervised work experience under 35.290, and 35.390,
15 it reads, "Work experience under the supervision of an
16 authorized user who meets the requirements of 35.390,
17 or equivalent agreement state requirements."
18 So, I guess the point I want to make here
19 is that leaving it in there would have, I guess,
20 caused inconsistency between the requirements for the
21 different uses. So, I just wanted to add that there
22 is a difference, I guess, among the work experience
23 requirements for 200, 300, 400, and 600 uses.
24 The other thing I just wanted to add is
25 that, for all of those requirements for supervised

1 work experience, it's still required for the proposed
2 AU to get their work experience under an existing AU.
3 CHAIR MALMUD: Thank you for bringing that
4 to our attention. So, this would make the change
5 consistent with the other paragraphs related to 200,
6 300, and 600.
7 DR. HOWE: 200 and 300, 100, 200, 300,
8 which are your -- generally considered your diagnostic
9 and therapeutic nuclear medicine.
10 CHAIR MALMUD: All right.
11 MS. FLANNERY: So, paragraphs -- the
12 requirements for 400 and 600 uses right now have a
13 more prescriptive requirement of having that
14 supervised work experience at a medical institution.
15 Whereas, 200 and 300 uses do not have that requirement
16 currently.
17 CHAIR MALMUD: Thank you. Dr. Eggli.
18 MEMBER EGGLI: Doug Eggli. I'm actually
19 quite comfortable with that. When I first started,
20 there was a phrase that was used that I haven't heard
21 as much lately, but it was "risk-informed regulation".
22 And as the numbers go up from 100, to 200, to 300, to
23 400, to 600, the risk to patients and public safety
24 also go up. So, I'm comfortable with the training and
25 experience regulations for Part 400, and Part 600 uses

1 to be more prescriptive than the training requirements
2 for Part 100, 200, or 300, because, in fact, the risks
3 associated are greater, as the number goes up. So,
4 I'm personally comfortable with that. I don't think
5 that that level of consistency is necessary, and I
6 think that makes a risk-informed regulatory
7 environment.
8 CHAIR MALMUD: Dr. Thomadsen.
9 VICE CHAIR THOMADSEN: Not that I disagree
10 with what you said at all, exception in the
11 regulation, the 390 requires 700 hours of training,
12 whereas 490 is only 500 hours. So, as the number goes
13 up, it doesn't look like the required training goes
14 up.
15 DR. HOWE: But you have to consider that
16 in 400, you're also required to have a residency
17 program before you get to the 500 hours. So, in 390
18 you're not required to have a residency program, so
19 the hours in 400 are really much greater than in 300.
20 CHAIR MALMUD: Thank you for that
21 clarification. Dr. Howe's recommendation for us to
22 consider is deleting the words, "at a medical
23 institution", which would bring consistency with the
24 other -- with 100, 200, and 300. Am I correct, that's
25 as it was explained to me.

1 DR. HOWE: That's correct.

2 CHAIR MALMUD: I still have my concern.
3 I'm not arguing the wisdom of the consistency. It
4 makes sense. I'm concerned, though, about whether or
5 not there is any documentation required, as we move
6 away from oversight. I'm used to -- I speak from a
7 very parochial perspective. I'm used to an institution
8 all of my career in which we have attendings
9 overseeing fellows, who are overseeing residents, who
10 are overseeing interns, who are overseeing students.
11 (Background noise.)

12 DR. HOWE: Yes, we can hear you. You're
13 not on mute.

14 MS. COCKERHAM: Could those on the phone
15 please press Star 6 to mute your line.

16 CHAIR MALMUD: And it has not been unusual
17 for a student to ask a question, which edifies all of
18 us. We had assumptions which were invalid, so there's
19 a series of peer reviews. And that leads to, I think,
20 fewer errors than would have occurred otherwise.

21 When we begin to move into smaller
22 settings, whether they are under the umbrella of the
23 institution, or not, there are fewer individuals
24 working together, and watching what each other might
25 be doing. And as we get into a satellite office,

1 let's say the satellite office has the gamma knife, or
2 just an ordinary radiotherapy unit, not a gamma knife,
3 we then create the possibility of kindness on the part
4 of the AU toward the trainee, in not requiring all the
5 details, that all the Is be dotted, and the Ts be
6 crossed, because the AU feels that the individual has
7 the requisite ability.
8 And, then, if a problem occurs in that
9 trainee later on, and we're asked for the
10 documentation, and it doesn't exist, that would
11 concern me, for our having allowed that to occur. So,
12 my question is, does the -- must the AU, who is, after
13 all, offering this training, keep any record of the
14 training that was offered? Is that a requirement?
15 DR. HOWE: That is not a requirement.
16 There needs to be documentation on the form, or in a
17 letter, but we don't require that there be something
18 at the facility that backs that up.
19 CHAIR MALMUD: Therefore, with the absence
20 of peer oversight, or collegial oversight, even in a
21 "private office", which may, or may not be associated
22 with an academic institution, or a training program,
23 we run the risk of an individual not really being
24 trained. That's what I'm trying to avoid, without
25 being unduly prescriptive. You don't want to get in

1 the way of the training, at the same time, we want to
2 be able to set up a system, or approve of a system,
3 since we're not setting it up, that meets requirements
4 that are consonant with our understanding of human
5 behavior at its worst.
6 DR. HOWE: Dr. Malmud, I think what I'm
7 hearing in the discussion is that even though this
8 appears to be a simple change, there may be a lot of
9 concern, and underlying unintended consequences that
10 are a concern to almost everyone at this table. It
11 may be that instead of making a decision on this
12 today, we may want to set up a subcommittee that can
13 really hash out the concerns that everyone has.
14 CHAIR MALMUD: I'll take that as a
15 suggestion which we can follow, but may I just ask one
16 more question? Would it be onerous for the AU to keep
17 track of what the AU is doing with the trainee? Would
18 that prevent us from accessing AUs who are willing to
19 train by giving them an undue burden? I have to ask
20 someone else that question.
21 DR. HOWE: I would ask Dr. Eggli.
22 CHAIR MALMUD: Dr. Eggli.
23 MEMBER EGGLI: For the Part 390 uses,
24 which is what I preceptor, we do keep records. And we
25 keep a file on everybody that we've ever written a

1 preceptor statement on going probably back to the
2 beginning of time. I look at this as sort of self-
3 defense, in a sense, because I never know when
4 somebody might come back and ask me to document the
5 training credentials, so we do keep records on
6 everybody we write a preceptor statement for, and we
7 keep them nearly forever.
8 DR. HOWE: Dr. Eggli, you've stated in
9 other public meetings with the ACMUI that you do not
10 keep the documentation that would support the
11 alternate pathway. You keep documentation to support
12 the Board Certification -
13 MEMBER EGGLI: The Board Certification.
14 That is true. That is true.
15 DR. HOWE: So, this would be at the level
16 of the -
17 MEMBER EGGLI: This is more like the
18 alternate pathway.
19 DR. HOWE: Yes.
20 MEMBER EGGLI: Yes, you're right.
21 CHAIR MALMUD: Rob.
22 MR. LEWIS: Thank you. You, Dr. Malmud,
23 have raised a very good question that I think we need
24 to take back and look at, because I can't understand
25 why we would have any regulation that there isn't some

1 kind of auditable record that the licensee can -- if
2 I'm an inspector, and I went in, and show me that
3 you're meeting this regulation, it's the licensee's
4 burden to do so. And they usually have to do so
5 through documentation. And if we have a situation
6 where we aren't creating that environment, we need to
7 look at what we're doing.
8 CHAIR MALMUD: Thank you. My observation
9 is that the individual who works in the satellite
10 office, whether it's a private venture, or not, is,
11 from my perspective, is competent, in general, as is
12 the individual at the university. But there's always
13 a tendency among all individuals to want to be
14 generous, and considerate of the person being trained.
15 And when there is absolutely no oversight, we run a
16 risk, which does not exist when there is oversight,
17 whether it's large private office with multiple
18 people present, or a large practice. It doesn't
19 matter whether it's a so-called private setting, or
20 academic setting. That risk will always exist. So,
21 we tend to document what we do. And my concern is the
22 concern that I mentioned. We have a comment from a
23 mEMBER of the public. Actually, NRC.
24 MS. BHALLA: Yes. This is Neelam Bhalla,
25 and I work for the NRC. And I'm in the rulemaking

1 division. So far as it being a burden, as it is, we
2 have some of the rulemaking, potential rulemaking
3 where it seems like there is -- it's a burden for the
4 authorized user to be providing attestation documents,
5 so added to that, if the authorized user is also
6 required to keep that documentation, that may be like
7 adding more on the authorized user who will be
8 providing this certification, or providing the
9 documentation. So, therefore, the responsibility
10 would really be on the person, or on the individual
11 user, who would be requesting that documentation.
12 And, therefore, it should not be -- or, perhaps there
13 would be an added burden on the authorized user who
14 will be providing that documentation to keep now a
15 record of what all this individual has provided. And,
16 therefore, I just wanted to say that we -- as it is,
17 we have request, and I believe it has come through the
18 ACMUI all the way to the Commission, that there is
19 already the authorized user feels the burden of
20 providing attestation requirements. And added to
21 that, if the authorized user now has even to keep a
22 record of what all he has provided, there may be some
23 sort of an issue there.
24 CHAIR MALMUD: If I may, I believe that --
25 what I do in nuclear medicine, which is not,

1 necessarily, applicable here, but what I do is to
2 certify, for example, the residents need to have had
3 three cases of I-131 therapy, less than 33
4 millicuries. I certify it. I give them a copy, and I
5 say this is your responsibility. I may be retired, I
6 may be dead. Some day you're going to need this
7 document. It is your's. Don't expect to find a copy
8 of it here at the university. I'm giving it to you
9 now. I do keep a copy, but that's not what I'm
10 telling them. I'm telling them it's their
11 responsibility.
12 When I was Honorably Discharged from the
13 Air Force, they gave me a document and said you may
14 never need this again. On the other hand, you may.
15 And, sure enough, 35 years later, I needed it for the
16 first time, but it was my responsibility, and that's
17 what I do with them. So, I don't think that the
18 record keeping is an issue. I think it's simply a
19 matter of having a form which says that A, B, C, and D
20 are part of what I trained, check off that they got A,
21 B, C, and D, sign it, give them a copy, and that's it.
22 But that's what I do. It may be that this is more
23 complex. You would know that better than I. We have a
24 number of comments. Dr. Suleiman.
25 MEMBER SULEIMAN: I know FDA across a wide

1 range of programs, I mean, when we don't spell it out
2 prescriptively in the regulations, or it's not,
3 necessarily, addressed in guidance, the responsibility
4 is on the end. I mean, if an inspector goes in and
5 wants to look at something, they're not going to take
6 somebody's word for it. They're going to want to see
7 record keeping, and documentation.
8 I guess my question is, is the practice
9 out there such that people who are doing this are, in
10 fact, keeping necessary records, or whatever? Do we
11 want to get prescriptive? Can this be addressed by
12 policy without having to be spelled out within
13 regulation, or is this being done so prevalently
14 across the board that we really don't have to worry
15 about it?
16 CHAIR MALMUD: Dr. Eggli.
17 MEMBER EGGLI: Well, maybe Jim can help me
18 with this, but Part 400, and Part 600 uses require
19 three years of training, I believe, in a certified
20 program. So, in a sense, I don't understand an
21 alternate pathway concept, because in reality, there
22 is no alternate pathway for 400 or 600, because you
23 must train for three years in a certified program.
24 My recollection of the discussion was that
25 this was a question of providing training for trainees

1 in these certified programs in a setting where that
2 certified program did not physically have all the
3 modalities, and had affiliated freestanding programs
4 that provided the experience that they weren't able to
5 provide. And I thought that that's why the clinic
6 piece was added in the recommendation last time, not
7 to serve as a true alternate pathway, but to add
8 legitimacy to the affiliated training sites that
9 provided training, essentially, for radiation therapy
10 residents. Jim, do I misremember this? It's
11 possible.
12 MEMBER WELSH: Jim Welsh. That's my
13 recollection of it, as well. For example, many
14 residency programs might not be located in a city or
15 town that has a whole lot of cervical cancer.
16 Therefore, GYN brachytherapy experience might have to
17 be sought at another institution. Pediatrics is the
18 same situation. Not every place does prostate
19 brachytherapy, but it's an integral component of
20 radiation oncology training. So, if it's not done at
21 the parent institution, it needs to be taught
22 elsewhere.
23 The burden of documentation in these
24 situations is on the trainee, who has to, at the
25 completion of that residency program, show that they

1 have the 500 hours of work experience, and be able to
2 state exactly where and when it was obtained. And
3 then, ultimately, it's signed off on by the residency
4 program director. So, there is documentation, but
5 it's not the authorized user who is keeping the
6 records, it's the one who is seeking to become an
7 authorized user. Of course, in reality, the authorized
8 user probably has a xerox copy of all this, but it's
9 the trainee's responsibility for procuring, and
10 securing that information, that documentation.
11 CHAIR MALMUD: Dr. Thomadsen.
12 VICE CHAIR THOMADSEN: I was just
13 concerned that the NRC might not have understood the
14 concern with the attestations. And the ACMUI can
15 correct me if I'm wrong, but I believe that what we
16 were saying is that people did not like to like to
17 have to attest to the competence of the person getting
18 the preceptor statement. It is not that they objected
19 to the documentation. And, in fact, what we
20 recommended is that the attestation say that the
21 student has completed the course of study, as opposed
22 to that the person is competent in the use of the
23 study. So, it's not -- the objection was not to the
24 documentation, but what was being attested to in those
25 documents.

1 CHAIR MALMUD: Your memory is correct.
2 Dr. Eggli.
3 MEMBER EGGLI: There was, however, a
4 second part to this that Dr. Howe was referencing,
5 which did refer to the, in particular, the American
6 Board of Radiology Diplomats who had a gap, and the
7 issue of the alternate pathway. And there are two
8 kinds of document keeping. The clinical experience
9 document keeping, how many therapies, and the
10 distribution of that kind of experience I do keep.
11 However, what I don't have is documentation of the
12 didactic training to the level of that the alternate
13 pathway requires documentation, so many hours on this
14 topic, so many hours on that topic. Because, for the
15 Board Certification pathway, that's all rolled in, and
16 there is no specific training requirement for any
17 number of hours of any specific didactic component, so
18 the records that I don't keep are the kind that would
19 satisfy alternate pathway for the didactic training.
20 The clinical experience part are records
21 that I do keep, but I'm not required to keep. So,
22 that was the issue on the alternate pathway versus the
23 Board Certification pathway.
24 CHAIR MALMUD: Dr. Guiberteau.
25 DR. GUIBERTEAU: I think we need to

1 consider that there are two types of training that
2 we're kind of pushing together here. One, is the
3 training that's received in an ACGME-accredited
4 residency, but there is -- in terms of the progression
5 of technologies, particularly in diagnostic radiology,
6 and nuclear medicine, and in radiation oncology, those
7 persons who have already completed their training will
8 likely not go back to residency to obtain that
9 training. And it is extremely important in order to
10 have enough people who are well-trained to do these
11 new procedures, that there is a pathway that they can
12 do it outside of an ACGME institution.
13 I think the point here is that this needs
14 to be -- this provision needs to be there. I do -- I,
15 personally, believe that at a medical institution, as
16 a medical institution is defined, does not really
17 satisfy the concerns of oversight. I do not believe,
18 as Dr. Thomadsen pointed out, that the concern about
19 the burden on authorized users was not that you
20 attested to the completion of training, it was you
21 were attesting to competence, which we did not want to
22 do.
23 If you are -- authorized users, in
24 general, most of them are not teachers, do not
25 provide this training, so there isn't any burden on

1 them. But I believe RRCs, and training programs, in
2 general, if you accept the responsibility to provide
3 the training, then I do not believe anyone doing so
4 would see it as a burden to document the completion of
5 training.
6 CHAIR MALMUD: Well, I think, Dr. Howe, as
7 usual, is correct, and that we probably should put a
8 small subcommittee together to come back with a
9 recommendation. I think that the anxiety on my part
10 is not with the change that has been recommended,
11 because I have no problem with dropping "at a medical
12 institution." My concern grew out of just thinking
13 about well, if it's even part of a residency, and I'm
14 sending the residents to a private clinic that's run
15 by a clinical faculty person, how do I know that the
16 resident is getting at the private clinic that which I
17 know the resident is getting at the home institution,
18 because of multiple oversight, which doesn't exist at
19 the private clinic, or the satellite office, if you
20 will, that might be run by someone who's income is
21 totally independent of the academic institution, and
22 who does this as a an adjunct to the academic
23 institution. So, we just need some form of
24 documentation that the individual truly received the
25 experience. Not that he or she is competent, but that

1 he or she received the experience.

2 Then, the training program director seeing

3 that, can feel quite comfortable in whatever his or

4 her responsibilities are. So, I'm not opposed to the

5 deletion of the prepositional phrase, "at a medical

6 institution". I'm just concerned about the issue of

7 oversight, once we get away from formal training

8 program sites. So, we could set up a subcommittee to

9 look at this issue, and actually approve your

10 recommendation. The concern that I'm raising is not

11 your proposal, Dr. Howe. It is really something that

12 comes out of the proposal, which is an awareness on my

13 part of something that might occur. Dr. Welsh.

14 MEMBER WELSH: I just have one point that

15 was briefly mentioned by Dr. Guiberteau, and relevant

16 to what you just said, Dr. Malmud; which is, the rigor

17 of the training.

18 Medical institution phrase there is

19 somewhat restrictive. I know that there are some

20 training courses that are done outside of a medical

21 institution, that actually do provide very serious

22 dedicated instruction that allows someone who might

23 not have had specific training in this particular area

24 to get up to speed in terms of classroom, some of the

25 radiation safety issues, and familiarity, so that when

1 they return to the clinic for the training with the
2 patients, they are given a significant head start.
3 By having the words "medical institution"
4 there, that might preclude such opportunity from being
5 incorporated into the 500 hours. Yet, as you point
6 out, experience at a private practice might not be
7 nearly as valuable as training provided by a formal
8 course, which might not be held within the medical
9 institution. Thus, I'm not in favor of keeping the
10 words "medical institution" there, because of that
11 restriction.
12 CHAIR MALMUD: Thank you. Nor am I. I
13 didn't suggest that we keep the wording. Dr.
14 Suleiman.
15 MEMBER SULEIMAN: Let me share an
16 experience. We have a situation right now at the
17 Agency where the failure of a facility to adhere to
18 the term "medical institution" has caused us to
19 undergo some sort of major enforcement action. And
20 it's precisely why I'm so agitated, because if we had
21 allowed -- if the medical institution term had been
22 enforced or interpreted correctly in the first place,
23 we wouldn't be in the situation we're in. I can't go
24 into any more detail, but you can create an
25 environment. The environment of that facility clearly

1 is not a medical institution environment, which led to
2 a whole bunch of other problems. So, maybe this is
3 not going to happen here, but I'm just saying that the
4 term was in there for a purpose, and to take it out
5 completely, you could open the door for some scenarios
6 to occur. That's my concern.
7 CHAIR MALMUD: Dr. Howe.
8 DR. HOWE: I would like to point out that
9 if you form a subcommittee, that they focus on the
10 training and experience requirements in here, because
11 for the alternate pathway for 400 and 600, 490 and
12 690, you have 200 hours of classroom and laboratory
13 training in certain topics. And then you have 500
14 hours of supervised work experience under an AU, and
15 then you have a three-year residency in radiation
16 oncology. So, those are not either/ors, those are
17 ands.
18 Now, it's possible that the 200 hours, and
19 the supervised work experience might be part of your
20 residency program. And then there's a possibility
21 that they may not be, if the residency program doesn't
22 focus on our issues, and focuses more on linear
23 accelerators, or things that are not within the NRC
24 purview. So, those requirements are three, and
25 they're ands. The Board Certification is just the

1 residency program, and then passing an examination.

2 CHAIR MALMUD: Thank you. Is there

3 interest in having a subcommittee look at this? If

4 there is none, we will just vote on this issue and

5 move forward. There appears to be none. In that

6 case, we will look at your recommendation, and vote in

7 favor or against it. We'll regard your recommendation

8 as a motion. Is there a second to the motion to

9 delete the term "at a medical institution"?

10 MEMBER WELSH: Second.

11 CHAIR MALMUD: Seconded. Any further

12 discussion of this motion? Dr. Suleiman.

13 MEMBER SULEIMAN: With all the discussion

14 that's occurred, is the NRC still comfortable with

15 your proposal, after what you've heard? If that's

16 what you're recommending, I mean, I'm going to vote

17 for -

18 MS. FLANNERY: Can I answer that?

19 CHAIR MALMUD: Yes.

20 MS. FLANNERY: When we discussed this

21 among the staff, we've discovered the exact situation

22 that Dr. Guiberteau described just a few minutes ago,

23 that we found that medical institution, the

24 definition, can be so broadly interpreted to include

25 disciplines NRC doesn't even regulate. That doesn't

1 provide -- it doesn't address the concern that was
2 expressed earlier about oversight.
3 CHAIR MALMUD: Right. We agree. All in
4 favor?
5 (A show of hands.)
6 CHAIR MALMUD: Any opposed? Any
7 abstentions? One abstention, no opposition. It
8 carries.
9 DR. HOWE: Okay. Thank you.
10 Okay. Issue Number 2. In one of the
11 medical events that I presented to you yesterday,
12 there was a degree of frustration on our part. And
13 once we realized that our written procedures in a
14 number of cases, not only are inadequate to provide
15 high confidence that administrations are in accordance
16 with written directives, but also they may be
17 inadequate in identifying medical events, and
18 identifying them in a timely manner. And what I'd
19 like to do is, I'd like to go over the case that,
20 essentially, focuses on these issues.
21 We had a manual brachytherapy case in
22 which none of the seeds were put into the prostate.
23 There happened to be two CT scans done at different
24 facilities. One was done by a radiologist, and he
25 read the first scan, he recognized that none of the

1 seeds were in the prostate, and he notified the
2 licensee's urologist immediately. Now, he didn't
3 notify the AU.
4 The patient was due to get a second CT
5 scan at the licensee's site within a day or two, so
6 the second scan was performed three days later, and
7 the AU read it immediately. And he identified that
8 there was mispositioning of the seeds, and that
9 external beam treatment was needed, so he clearly
10 looked at the scans, recognized he had issues with it.
11 And then he sent it on to the medical physicist with
12 no note for the medical physicist to do a quick
13 evaluation, or any other notes. So, the medical
14 physicist put it in the pile, and a month later got
15 around to reading it, and recognized that there were
16 no seeds in the prostate. So, they identified it as a
17 medical event only after the medical physicist read
18 the images. But, in this particular case, it was
19 clear all the way down the line that there was a
20 problem with the administration. And we felt that the
21 licensee had the knowledge, should have identified the
22 medical event much earlier, and waited. So, we
23 believe it should have been identified quicker, so
24 we're looking at our requirements.
25 We don't have requirements that you do a

1 CT at a certain period of time that's a practice of
2 medicine. We don't have a requirement that you pass
3 on a CT in a period of time. That's, to some extent,
4 the local choice. But we feel that medical events
5 should be identified as quickly as possible,
6 especially in these extreme cases. So, we searched
7 for a place where we could maybe make a change that
8 would be individual for the licensee, but would be
9 effective in identifying things quickly. And what we
10 came up with was the idea that 35.41, which is where
11 you have a written program to insure that
12 administrations are in accordance with the physician's
13 written directive might be a good place to add a
14 requirement that would capture the idea that medical
15 events -- that errors in administration should be
16 evaluated in a timely manner.
17 So, the next slide shows you the possible
18 solution. And that would be to add a criteria that
19 there be high confidence that the administration -- if
20 the administration is not in accordance with the
21 written directive, that a determination whether the
22 administration resulted in a reportable medical event
23 is made in a timely manner.
24 And the next slide shows just a suggested
25 language, and you probably have to use the book,

1 because my pink coloring didn't show up very well.
2 But it was to add a third item under the existing two
3 items that says, "If the administration is not in
4 accordance with the written directive, a determination
5 of whether it resulted in a reportable medical event
6 will be made in a timely manner." So, that seems to
7 be a performance type of standard. It gives the
8 licensee flexibility, but meets our concerns that
9 these things are identified. And puts more emphasis
10 on the fact that if physicians and physicists realize
11 something is not in accordance with the written
12 directive, that they need to think in terms of whether
13 it's a reportable event, or not.
14 CHAIR MALMUD: Thank you. That's open for
15 discussion. Dr. Eggli.
16 MEMBER EGGLI: I think I would support
17 this change, but my comment would be that that would
18 still not have picked it up until the fourth bullet.
19 The first scan was ordered by the patient's urologist,
20 not the authorized user. The radiologist's
21 obligation, who read the CT scan, is to report that
22 study back to the requesting physician, and would
23 have no idea whether or not that information ever made
24 it back to the authorized user, who actually treated
25 the patient. So, it would certainly pick it up at

1 least one step earlier. But when a study which might
2 identify that the treatment had not been successful is
3 ordered by a physician not directly related to that
4 treatment process, there is nothing that will
5 guarantee that that result will get back to the AU,
6 unless the urologist called him and said well, what
7 the heck did you do? None of the seeds were in the
8 prostate.
9 DR. HOWE: And I think we were looking at
10 the AU should have recognized it, and started the ball
11 rolling.
12 MEMBER EGGLI: Yes, at the time of the
13 second scan. Okay. I've got no problem with that.
14 Just to make it clear, though, that the first scan
15 would not have started the process rolling.
16 CHAIR MALMUD: Dr. Howe, the definition of
17 having administered in accordance with the written
18 directive leaves a margin of the same percent that we
19 discussed last time for the number of seeds that would
20 not be necessarily in the prostate. Is it 20 percent?
21 DR. HOWE: I think so.
22 CHAIR MALMUD: So, there's no need to
23 address the specifics, but there is some leeway,
24 because I know that the radiation oncologist who was
25 discussing this last time was very concerned about not

1 restricting the correctness of the dose any more than
2 that at the time, if I remember correctly.
3 DR. HOWE: Right. And we understand that
4 those that are close calls would take more evaluation.
5 But some of these really obvious things, we'd just
6 like them to think in terms of do you need to go
7 another step further?
8 CHAIR MALMUD: Thank you. I would just
9 ask the radiation oncologist, and radiation oncology
10 physicists here if either of them has a comment
11 regarding this.
12 MEMBER WELSH: This is Jim Welsh. I have
13 a couple of comments. First, regarding the specific
14 case, it's hard for me to understand why two CT scans
15 were really performed. This really has got nothing to
16 do with the matter at hand, just an editorial. But,
17 in an era where we're trying to minimize the number of
18 unnecessary scans, this is a glaring example of lack
19 of communication resulting in unnecessary CT scan.
20 Since the AU is going to do a post-implant dosimetry,
21 and required a CT scan for that, it's not clear why
22 the urologist would order a separate CT scan, and
23 there was, obviously, lack of communication.
24 But the important points here are that
25 post-implant dosimetry is recommended, but it's not

1 required. So, you would still have a number of
2 situations where you might not pick things up with the
3 change in the wording. In fact, unless it becomes
4 required, rather than strongly recommended, it could
5 be misconstrued as another way to get yourself in
6 trouble. And, therefore, people might even start to
7 shy away from doing post-implant dosimetry. I would
8 recommend that it become a requirement.
9 The definition of timely is vague here, so
10 the question at-large is, what is the ultimate purpose
11 of all of this? It's to identify medical events,
12 misadministrations. And does it really matter if it's
13 picked up in a month, or in two months? It might not,
14 but unless we specifically describe what we mean by
15 timely, it could be open to interpretation and
16 argument that a year later is still timely, a month
17 later is not timely. So, I would recommend that if we
18 change the wording, we have to be a little bit more
19 specific. And to complicate things, it might be
20 isotope-dependent, because the half lives are so very
21 different.
22 CHAIR MALMUD: Thank you, Dr. Welsh. Dr.
23 Thomadsen.
24 VICE CHAIR THOMADSEN: I agree with all
25 the points that Dr. Welsh made. In addition, I'm not

1 sure that you need this to address the case as the
2 example, and that once the authorized user saw the CT,
3 it should have been quite clear that there was likely
4 a medical event. And, at that point, they were
5 obliged to report it. I think that it sounds like the
6 authorized user did not execute his or her required
7 duty at that point. I don't think he needed number
8 three to do that.
9 If you do decide to write something like
10 number three, I don't think it says what you want. It
11 says, "if the administration is not in accordance with
12 the written directive", which already meets the -- but
13 if it is in accordance with the written directive, do
14 you not need to do any further studies? Of course,
15 you don't know that, so the wording of, "if it's not
16 in accordance", you don't know whether it is, or
17 isn't, so you don't want to write the rule dependent
18 on something like that. I'm not sure that you need
19 this. I think we already have the requirement to
20 assess what's -- whether it's in accordance or not.
21 CHAIR MALMUD: Other comments? Rob.
22 MR. LEWIS: Just to clarify, you're saying
23 that your logic is because an agent of the licensee
24 knew a medical event existed, the licensee is then put
25 on the clock to report the medical event? And,

1 therefore, the timeliness takes care of itself.

2 VICE CHAIR THOMADSEN: Yes. Right. Since

3 it was the authorized user -- the first CT is

4 completely irrelevant to the discussion, and to the

5 case. But once the authorized user knew that there

6 was a problem, the clock is already ticking.

7 CHAIR MALMUD: Dr. Malmud. I have a

8 question. In the practice of radiation oncology, do I

9 understand it's not necessary -- not a requirement to

10 do a post-therapy CT scan? Is that right, Dr. Welsh?

11 MEMBER WELSH: I don't believe it's

12 actually required. It's strongly recommended,

13 American Brachytherapy Society, for example, has it in

14 their recommendations, but I'm not sure it's in the

15 regulations.

16 CHAIR MALMUD: So, that it's possible if a

17 patient were to receive seed implantations that were

18 all incorrectly placed, if the patient would not have

19 been treated for the prostate cancer, there would be

20 no record of this. And the patient could then

21 theoretically go on to metastasize, have had a

22 metastatic tumor, for lack of follow-up to the

23 therapy.

24 MEMBER WELSH: That is correct. And that

25 may have been the situation in the VA cases that we've

1 discussed recently, because of some difficulties with
2 the post-implant dosimetry routine. So, it's not a
3 mandatory step. I would, actually, recommend that it
4 become so, because it would, perhaps, correct some of
5 the concern that's being discussed right here, and why
6 we would be changing the language in the first place.
7 If it were a requirement, then much of this would go
8 away.
9 CHAIR MALMUD: Would that requirement be a
10 requirement of medical practice, or a requirement of
11 the NRC, Dr. Howe?
12 DR. HOWE: The NRC requirement is
13 performance-based. It says, "For any administration
14 requiring a written directive, the licensee shall
15 develop, implement, and maintain written procedures to
16 provide high confidence that", and then one of the
17 items is, "each administration is in accordance with a
18 written directive." That gives the licensee
19 flexibility to determine what that program is. And
20 Dr. Welsh's point is that he believes that licensees,
21 if they're doing what they should be doing, in
22 accordance with kind of the standards of care, would
23 do post-implant CTs, but it would not be a specific
24 NRC requirement to do post-implant CTs. It would be,
25 they have to have some program to make sure the

1 administration is in accordance with the written
2 directive, however they do that.
3 CHAIR MALMUD: I understand that. And
4 that's what's raising my anxiety level of -- the
5 incidents of microscopic prostate cancer in men is
6 equal to their decade of life, as I recall. I don't
7 know the incidents of significant prostate cancer is,
8 but microscopic is equal to our decade of life. So,
9 if it's something analogous to breast cancer, about
10 one in seven of us will get it, if we live long
11 enough.
12 The more I hear about the standards for
13 the delivery of brachytherapy, the more I am convinced
14 that it's a therapy I would not choose for myself. To
15 have a therapy applied to me, and not to measure
16 whether or not the therapy was effective, to me, is an
17 indication that I, as a patient, and I as an
18 individual who is concerned about the public well-
19 being, would not choose this therapy. Is there anyone
20 at this table who would under those circumstances,
21 without any follow-up? You're shaking your head yes?
22 MEMBER MATTMULLER: I'm in agreement.
23 CHAIR MALMUD: You agree. I mean, I am
24 made anxious, again. I used that term once before,
25 and, unfortunately, it was quoted, but the anxiety

1 persists. This is very anxiety-provoking for me, as a
2 potential patient. Dr. Suleiman.
3 MEMBER SULEIMAN: First off, I do disagree
4 whether this is just a medical practice issue. I think
5 it's also a safety issue. The NRC is responsible for
6 the safe use of radioactive materials, so I clearly
7 think that validating -- and I'd be afraid to just
8 require a CT scan. Technology changes, there may be
9 other imaging modalities. In other words, locking it
10 into CT, maybe there are some other imaging modalities
11 to validate. But I think validating that the seeds
12 were -- these are cancer patients undergoing
13 radioactive being inserted into them, so it's obvious
14 that after this whole procedure is over, it should be
15 validated, even from just a safety point of view.
16 But, clearly, it's a medical issue, but it's also a
17 safety issue. So, we're operating at the fringes that
18 I had talked about. If society has already accepted
19 validating after-the-fact, maybe it should be codified
20 so that these fringe operators are required to do it.
21 DR. HOWE: This requirement is written for
22 all things requiring written directives, not,
23 necessarily, just the manual brachytherapy. So, it's
24 stated in a very general manner.
25 CHAIR MALMUD: My concern was not about

1 the CT, specifically. It's just about the follow-up
2 to the therapy to make certain that it was delivered,
3 and not misdelivered, to validate it. We have a
4 comment? Please identify yourself.
5 MS. VILLAMAR: Glenda Villamar with the
6 NRC. I just wanted to share that some licensees read
7 this regulation where they're actually -- they'll
8 actually wait for a calculation to be performed before
9 they report that a medical event has occurred. And
10 they're not, necessarily, even though the authorized
11 user might see it on the scan immediately that no
12 seeds had made it into the prostate, they're still
13 waiting for an actual number. That's just how
14 licensees are reading this regulation.
15 CHAIR MALMUD: Yes, I understand that.
16 But how would they know at all if there were no
17 follow-up studies? They would not. Am I correct?
18 MS. VILLAMAR: Yes.
19 CHAIR MALMUD: That's what concerns me. I
20 don't know whether that's a practice of medicine
21 issue, which would be deferred to the radiation
22 oncology specialists, or whether that's an issue for
23 the NRC. But I do know that it's an issue.
24 I think there was a case recently in which
25 it was decided that they weren't going to do them

1 within a certain time period, or at all, because the
2 patients were traveling a great distance to get the
3 therapy, and couldn't get the follow-up. Once again,
4 if there's no follow-up, there's no knowledge. If
5 there's no knowledge, not only is the patient denied
6 the therapy, but the patient may suffer the
7 consequences of the therapy, or the absence of it.
8 Sue?
9 MEMBER LANGHORST: Sue Langhorst. In
10 regard to the proposal of this Item 3, I want to go
11 back to Dr. Thomadsen's comment, that I think it
12 states the obvious. To me, if it isn't in accordance
13 with the written directive, you evaluate whether you
14 have a medical event. So, I think maybe if the NRC
15 feels they need a stronger statement in regard to
16 this, it might be better suited in a strong statement
17 in the guidance documents that go along with this,
18 rather than putting it in, an obvious thing like this
19 in the regulations.
20 MEMBER FISHER: Darrell Fisher. It seems
21 to me, from my limited knowledge, that Item 2 requires
22 that each administration is in accordance with a
23 written directive, if that's not the intent. And how
24 does the NRC wish to regulate this matter? It would
25 seem to me that the medical institution could not show

1 Item 2 without doing post-treatment imaging and
2 dosimetry. How would the regulations work? I mean,
3 is it only incumbent on the licensee to administer, or
4 to both administer, and validate the administration as
5 being in the target tissue?
6 DR. HOWE: I believe the requirements
7 require a validation, because they have to have
8 written -- develop, implement, and maintain procedures
9 that show the administration is in accordance with the
10 written directive.
11 MEMBER FISHER: Then it would seem that
12 you have what you need without adding Number 3. One
13 and two provide that assurance.
14 CHAIR MALMUD: Doctor -- oh.
15 MR. LEWIS: If I could, I think that the
16 procedures wouldn't, necessarily, dictate a timely
17 investigation. And I think that's what they were
18 getting to. In this case, it was ultimately reported
19 to us. We just didn't think that the licensee was
20 particularly diligent in pursuing it as soon as they
21 knew.
22 DR. HOWE: And we've also had other
23 licensees that have indicated yes, we knew they had
24 problems, but they never bothered to look to see if
25 they had medical events.

1 MEMBER FISHER: Is timely 30 days, or 60
2 days, or is it a year, or two years, or five years?
3 CHAIR MALMUD: If I may -
4 DR. HOWE: Go ahead.
5 CHAIR MALMUD: If I may, that may be a
6 medical question. There are couple of things coming
7 up here, and I don't have the knowledge to address
8 them. It seems to me that the college, the Governing
9 College for Radiation Oncology, or the Board of
10 Radiation of Oncology, must have standards which do
11 require post-therapy follow-up. And they probably
12 exist. I would assume they're not prescriptive,
13 because technology changes, ultrasound versus CT,
14 versus whatever else is coming down the pike. But
15 they must exist. And I can't imagine anyone who is
16 not doing post-therapy follow-up, so I would assume
17 that that's there, but that's an assumption. And we
18 have to determine that with the appropriate
19 individuals. Can you speak for the Board, or the
20 requirements?
21 MEMBER WELSH: This is Jim Welsh. I don't
22 think that it's a Board requirement, but it is
23 recommendation from the ABS, and it is something that
24 is considered standard of care by most careful
25 practitioners. But I don't think that it's an

1 absolute mandatory requirement. And, therefore, it is
2 still possible, from what I see, that there could be
3 sub-standard practices out there in which this set of
4 recommendations that we're talking about here is not
5 strictly adhered to, at all.
6 CHAIR MALMUD: So, as a radiation
7 oncologist, and as a male, would you ever undergo
8 brachytherapy without a follow-up of some sort?
9 MEMBER WELSH: I would make sure that the
10 facility that was going to perform this adheres to the
11 recommended standards, and has a good record.
12 CHAIR MALMUD: So, you would want the
13 follow-up.
14 MEMBER WELSH: Absolutely.
15 CHAIR MALMUD: Right. So, that's a
16 medical practice issue, is it not?
17 MEMBER WELSH: I think it's a medical
18 practice issue, but as Dr. Suleiman pointed out, it's,
19 perhaps, also a safety issue.
20 CHAIR MALMUD: And if it's a safety issue,
21 then it comes back to, in essence, our responsibility
22 to make certain that the appropriate board understands
23 that we're concerned about the potential for a patient
24 to have had radiation oncology brachytherapy, and did
25 not have the follow-up, and not be aware of the

1 efficacy of the therapy. And that is something which
2 we should not allow to occur, and which I assume
3 they're not allowing to occur.
4 Debbie, you have your hand up.
5 MEMBER GILLEY: Yes, Debbie Gilley. I
6 just wanted to reassure the NRC that as part of
7 getting a radioactive materials license, they are
8 required, the licensee is required to submit
9 procedures. And in those procedures, there are some
10 standard procedures that we use that they can adopt,
11 or they can develop their own. But in the standard
12 procedures for NRC, it does require them to do
13 radiographs, or comparable images, such as
14 computerized tomography, for the basis of verifying
15 the position of the non-radioactive dummy sources, and
16 calculating prior to, and then after. So, there are
17 some procedures that are part of the license
18 application that we hold the licensees accountable for
19 in order to be able to do these procedures. So, it's
20 not just the regulatory requirement, but also the
21 procedures that they submit as part of their
22 application.
23 DR. HOWE: Debbie, just to clarify NRC
24 requirements, NRC does not require the licensee to
25 provide their procedures to meet the requirements in

1 35.41, because these procedures came out of the
2 Quality Management program. And the decision when we
3 implemented the Quality Management program was that
4 the procedures for that program should be flexible
5 enough for the licensee to change at any time. And,
6 therefore, were not submitted to the NRC, and are not
7 tied down in the license condition.
8 The requirement is that they develop,
9 implement, and maintain. They do not have to provide
10 these procedures to the NRC. And, if they do provide
11 them to the NRC, we state back in our cover letter
12 that we have not evaluated them, and we do not
13 consider them to be part of the license, because we do
14 not want them to have to come in for a license
15 amendment in order to change them. So, the fact that
16 they have the procedures is a requirement. What the
17 procedures say is not tied down in the license.
18 MEMBER GILLEY: Then I'd like to go on
19 record saying that that is not true in some of the
20 agreement states.
21 DR. HOWE: And that may be true, but for
22 NRC, that is the way we license.
23 CHAIR MALMUD: Dr. Welsh.
24 MEMBER WELSH: Oh, I was just pointing to
25 -

1 CHAIR MALMUD: Oh, a member of the public.
2 MS. FAIROBENT: Lynne Fairobent with AAPM.
3 Donna Beth, however, whether or not the licensee
4 submits the procedures, they are available for review,
5 and I believe they're inspectible, if they're not
6 being followed. So, they're still, whether they're a
7 tied down specific license condition or not, they are
8 still part of their license, and they are reviewable,
9 and inspectible. If that's not the case, then please
10 clarify.
11 DR. HOWE: They are inspectible, but they
12 are not -- the procedures that are in effect when the
13 licensee submits their application do not have to be
14 the procedures that are in place when we do an
15 inspection. They can be changed, and you don't have
16 to seek an amendment, so NRC has not reviewed those
17 procedures. The licensee is tied to having the
18 procedures, and we do review them if we find that
19 there is a reason to review them. One reason to
20 review them would be if we think there is a medical
21 event.
22 CHAIR MALMUD: Dr. Eggli.
23 MEMBER EGGLI: Part of the argument here
24 has been that Number 3 is superfluous, that it should
25 be obvious from the rest of the regulation. I never

1 cease to be amazed how often what is obvious to me
2 isn't obvious to everybody. I'm a firm believe in the
3 Will Rogers school of public speaking, which says you
4 tell people what you're going to tell them, then you
5 tell them what you're telling them, and then when you
6 tell them what you told them. If there's a concern
7 that what should be obvious, isn't behaving as
8 obvious, I don't see the harm in adding an additional
9 statement. And I would, with the exception that maybe
10 timeliness probably should be tacked down, I see
11 benefit, and no harm, in restating the obvious,
12 because what's obvious to me, isn't always obvious to
13 everybody else.
14 CHAIR MALMUD: That's a motion in favor.
15 MEMBER EGGLI: In favor.
16 CHAIR MALMUD: If Dr. Howe's proposal is a
17 motion, you second it?
18 MEMBER EGGLI: Yes.
19 CHAIR MALMUD: Is there any further
20 discussion of this motion? And then we can get back
21 to the other issue. All in favor? Oh, excuse me.
22 VICE CHAIR THOMADSEN: Discussion.
23 THE WITNESS: Excuse me.
24 VICE CHAIR THOMADSEN: Regardless of the
25 point that was just made by Dr. Eggli, I think the

1 wording, other than the timeliness, still remains to
2 be cleaned up, because it's a conditional, which is
3 unfortunate. And it shouldn't be written in that
4 manner.
5 DR. HOWE: This is a potential change. If
6 it becomes a proposed change, it will be -- it will go
7 through a lot of review, and it won't, necessarily,
8 look like this.
9 VICE CHAIR THOMADSEN: Yes.
10 CHAIR MALMUD: Dr. Thomadsen?
11 VICE CHAIR THOMADSEN: Also, I think that
12 it is unnecessary, because we do have the timeliness
13 of when you find something out. For permanent
14 implants, for example, with the changes that we've
15 made, you don't need to do dosimetry to know that
16 there's been a medical event. You just have to look
17 at where the seeds are, and count the seeds, so it's
18 not a matter of even waiting for dosimetry to be done
19 after the CT. All it has to do is to be looked at, in
20 which case, I don't think that this is necessary. And
21 I'm not in favor of redundancy in regulations, because
22 inevitably, if you tell them what you're going to tell
23 them, tell them, and then tell them what you told
24 them, and have it three times in the regulation,
25 you're going to have situations where you have

1 conflicts in the regulations that shouldn't be there.
2 And regulations should only be telling things once,
3 so you make sure that you have what you want said, and
4 say it clearly once.
5 CHAIR MALMUD: Thank you, Dr. Thomadsen.
6 Sue?
7 MEMBER LANGHORST: Sue Langhorst. I agree
8 with that. And I think you can tell them in a
9 different venue than in the regulations. I think
10 information notice, regulatory issue, guidance
11 document. I think you can tell them what you're going
12 to tell them, tell them, and then tell them what you
13 said in that venue. And I don't -- I agree, it should
14 not be in the regulations.
15 CHAIR MALMUD: Dr. Welsh.
16 MEMBER WELSH: Jim Welsh. In this
17 particular case that was discussed, the identification
18 of the medical event not being within a timely fashion
19 was, perhaps, due to the authorized user suspecting,
20 based on what he saw with his own eyes, that there was
21 a mistake, or a problem, but was reluctant to formally
22 report it until it was quantified. So, rather than
23 just a qualitative evaluation suggesting that the
24 prostate was under-dosed, or the -- another organ was
25 overdosed, he waited until the physicist did the

1 formal post-implant dosimetry to determine whether or
2 not this was truly a medical event. And, in that
3 sense, I think that this was understandable.
4 The point here, however, is that if the
5 post-implant dosimetry was not ever performed, none of
6 this would have ever been identified. And that would
7 be a problem.
8 As written, with 1 and 2 there, Number 2
9 says, "Each administration is in accordance with the
10 written directive." Implicit there is that there has
11 to be some means of ascertaining whether or not the
12 implant was done properly. And I would see in there
13 that post-implant dosimetry is included. To me,
14 that's obvious. But do we have to be a little bit
15 more direct in that? That's a question for another
16 debate, but I would say yes, because what's obvious to
17 me, is not obvious to everybody. But I don't think
18 that Number 3 is really mandatory. I think 1 and 2
19 say it all. If we expand Number 2 to say, "Each
20 administration is in accordance with the written
21 directive, and verified with post-implant dosimetry",
22 would suffice.
23 CHAIR MALMUD: Dr. Welsh, are you
24 proposing an amendment to the motion, which would add
25 a phrase, "In accordance with post-implant dosimetry"?

1 Is that what you were suggesting?

2 MEMBER EGGLI: This is a generic rule that

3 doesn't apply, necessarily, to brachytherapy, but all

4 therapies for which a written directive is required.

5 And, in many cases, a follow-up dosimetry would be

6 inappropriate. For instance, the radioactive therapy

7 for hyperthyroid disease, a follow-up dosimetry would

8 be an inappropriate procedure. So, I don't think you

9 can change the generic regulation to state that.

10 DR. HOWE: One issue we're also trying to

11 get at, we've had a number of cases recently where

12 it's come to our attention that the authorized users

13 are not aware of what the definition of a medical

14 event is. So, they know they have something that's

15 not in accordance with administration, but they're not

16 even thinking in terms of medical events. And part of

17 this change would be to make it very clear that if

18 it's not in accordance with your administration, then

19 you need to think in terms of a medical event. And if

20 you don't know what a medical event is, you need to

21 find out what it is, because you need to make this

22 determination.

23 CHAIR MALMUD: Good point. Dr. Thomadsen.

24 VICE CHAIR THOMADSEN: But I don't think

25 that will make a difference. If they don't know what

1 a medical event is, adding another regulation here
2 isn't going to make them know what a medical event is.
3 We've got a different problem there, if they don't
4 know what a medical event is. And we should solve
5 that problem directly, as opposed to trying to solve
6 indirectly by adding something else in a different
7 part of the regulations.
8 CHAIR MALMUD: The motion remains before
9 us. Any further discussion of the motion? All in
10 favor of the motion?
11 MEMBER EGGLI: I remain stubbornly in
12 favor.
13 CHAIR MALMUD: Oh, I beg your pardon.
14 You're in favor.
15 MEMBER EGGLI: I am.
16 CHAIR MALMUD: Was it amended?
17 MEMBER EGGLI: It has not been amended.
18 CHAIR MALMUD: No, it is as it stands on
19 the page in the book, which is legible. All in favor
20 of the motion?
21 (A show of hands.)
22 CHAIR MALMUD: All opposed? All
23 abstentions? The motion doesn't carry.
24 DR. HOWE: Please give the vote for the
25 record.

1 CHAIR MALMUD: Okay. All in favor of the
2 motion? Two. All opposed? Two, four, five. All
3 abstentions? Two.
4 DR. HOWE: Thank you, Dr. Malmud.
5 CHAIR MALMUD: Thank you, Dr. Howe.
6 Having brought up something which may not
7 be an issue, I'd like to resolve it, so that it isn't
8 an issue. It appears that the standard of care is
9 that following brachytherapy, some form of post-
10 therapy evaluation is routine. Is that correct, Dr.
11 Welsh?
12 MEMBER WELSH: It is.
13 CHAIR MALMUD: Therefore, the anxiety that
14 I expressed is not relevant, since it is routine to do
15 post-therapy dosimetry, a post-therapy evaluation of
16 where the seeds are.
17 MEMBER WELSH: It is routine among those
18 who are skilled, and knowledgeable in the procedure,
19 and those who I would recommend a patient go to. But
20 since it is not absolutely mandatory, I suspect that
21 there are still those out there who might not adhere
22 to these standards, since they are not absolute
23 requirements.
24 CHAIR MALMUD: To the best of your
25 knowledge, within the world of radiation oncologists,

1 does the Governing Board for Radiation Oncology have
2 it as part of their standards that post-therapy
3 brachytherapy evaluation should be done?
4 VICE CHAIR THOMADSEN: ACR?
5 CHAIR MALMUD: ACR?
6 VICE CHAIR THOMADSEN: ACR would be the
7 only one with standards who practice -
8 CHAIR MALMUD: ACR.
9 VICE CHAIR THOMADSEN: They have
10 guidelines in the AAPM, there's guidelines that coming
11 on board, but they don't certify practice -
12 COURT REPORTER: Speak into the
13 microphone.
14 VICE CHAIR THOMADSEN: I'm sorry. I was
15 trying to ascertain the information rather than have a
16 discussion with the group, because I do not know the
17 answer to that question. But the information would be
18 available. The only organization I can think of that
19 would actually be relevant to this would be the
20 American College of Radiology, which departments can
21 be accredited by. There are standards, both by the
22 ABS and the AAPM that would dictate after a permanent
23 implant you do dose -- you do post-procedural
24 evaluation. And there are guidances for what that
25 would entail. But those are guidelines, they wouldn't

1 be part of an accreditation for a department.

2 I'm also not sure how big of a problem

3 this is. I'm not aware of facilities that don't do

4 any. But, then again, they may not be facilities with

5 whom I would have any discussions.

6 DR. HOWE: Just as anecdotal data, we

7 don't know what the situation is out there. But we do

8 know, because we have had a chance to look extensively

9 at the Department of Veterans Affairs and their manual

10 brachytherapy program, that for a period of time their

11 computer systems were not compatible at multiple

12 locations. And in those locations, they tried to fix

13 it with a work-around quickly, but in multiple

14 locations, we had post-implant CTs that could not be

15 evaluated with the treatment planning systems, because

16 of incompatibility of the computer systems. And in

17 the Department of Veterans Affairs at Philadelphia,

18 they let it go on for a year and a half. In the other

19 facilities, they got work-arounds in a much more

20 timely fashion so that they could evaluate the post-

21 implant CTs, but anecdotal data. We do know not

22 everybody evaluates things in a timely fashion, for

23 one reason or another.

24 MEMBER WELSH: That answers your question.

25 CHAIR MALMUD: Dr. Welsh says that you

1 have just answered my question, which is that it isn't
2 always assured.
3 MEMBER WELSH: Not 100 percent are doing
4 it. Maybe it's close, but I wouldn't be able to tell
5 you exactly.
6 CHAIR MALMUD: Now, we come to my concern.
7 Having tripped across the issue, though it's not the
8 focus of what we were discussing, it would be remiss
9 of us to ignore it. Someone has to deal with it,
10 either the ACR, or the NRC, or both. Rob?
11 MR. LEWIS: Well, with the NRC, and part
12 of our internal procedures, we have a Lessons Learned
13 program. And we are currently chartering a Lesson
14 Learned Group with respect to the Veterans Affairs
15 event. And it's internally focused, so we'll be
16 looking at what we require in licensing, and what we
17 require in inspection. It's nothing about what VA did,
18 or didn't do. It's about what we do. And part of the
19 charter, I expect to be what we require by way of
20 post-implant verification. So they will look into the
21 issue. We'll bring the Lessons Learned, I can commit
22 to you, before the Committee at a future meeting, so
23 we can have that discussion.
24 CHAIR MALMUD: Thank you. Dr. Suleiman.
25 MEMBER SULEIMAN: Somebody once lectured

1 me and said if it's a safety-related issue that
2 impacts on the public, don't be afraid of a
3 regulation.
4 The professional practices, the societies,
5 they take the lead. As Bruce had said earlier, you
6 may not -- you don't know, what you don't know. That
7 was another famous quote I remember. And, so, the
8 people who may not be reporting these medical events
9 may not be doing validation in a timely manner. So,
10 maybe they're taking a picture, because they're saying
11 oh, we have to do that several months downstream. And
12 if it's an inappropriate isotope, by the time they
13 take that image, it may no longer be relevant, because
14 there's nothing they can do about it.
15 It would be nice if we had some data,
16 whether this is a figment of our imagination, or these
17 sort of things happen out there. But, the point is, I
18 get a sense that if it is happening, nobody is going
19 to know about it. So, I think some sort of high-
20 confidence validation, or verification, which would
21 clearly include a temporal, a time element in there,
22 for brachytherapy sounds to me like it's obvious. I
23 mean, it -
24 CHAIR MALMUD: It's obvious to me, but it
25 may not be obvious. It's obvious to you. But Rob

1 indicates that he believes that their current
2 investigation will result in a recommendation, and
3 that recommendation will then come to us, and then it
4 could be made applicable.
5 The way I tried to Chair this, at your
6 request, is to always look at the questions from a
7 position of naivete, which isn't difficult for me in
8 many areas. But, the point is, the concern of
9 everyone on this Committee is the safety and welfare
10 of the public, including both people who work in
11 radiation, and people who receive radiation.
12 I always remind myself that that's what
13 we're here for, and that's why I should ask naive
14 questions. The balance that we're trying to achieve
15 is to maximize the access to therapeutic interventions
16 for the public, and, at the same time, not restrict
17 them by being overly prescriptive, and preventing
18 physicians, or others, from providing those services.
19 And that's what we're trying to weigh, all of us.
20 It's quite obvious in these discussions. So, we all
21 have the same goal.
22 The corollary to that is that sometimes we
23 trip across things which are really not our turf. But
24 we should, nevertheless, find some means of addressing
25 them, if we trip across them, even though it may not

1 be technically in the NRC area. And this particular
2 question, for me, is one that I think needs to be
3 solved in two ways. One is by asking the people who
4 are most knowledgeable, and they are the radiation
5 oncologists, what they would like to see as an
6 absolute standard. And the second one is for us to
7 help enforce that standard, and to make certain that
8 the public, and the radiation workers are safe. Dr.
9 Welsh.
10 MEMBER WELSH: I'd just like to amplify
11 those points, and conclude by saying that the issue is
12 clearly a radiation safety issue, as well as medical
13 practice issue. And, therefore, I think NRC does have
14 a role in specifically stating how this should be
15 standardized.
16 I was very pleased to hear what Rob Lewis
17 just said about a formal statement about Lessons
18 Learned, and I look forward to seeing what that shows.
19 CHAIR MALMUD: Thank you, Dr. Welsh. And
20 I am pleased that you have volunteered to say that as
21 a member of the radiation oncology world. That's very
22 reassuring. Debbie?
23 MEMBER GILLEY: I just would like to bring
24 up, since you're talking about Lessons Learned, that
25 maybe we ought to be looking at performance-based

1 licensing versus the prescriptive way we do licensing.
2 And maybe in certain instances, we do need to be more
3 prescriptive, as in with what is required for
4 brachytherapy.
5 CHAIR MALMUD: Thank you. I believe that
6 -- does that complete your presentation, Dr. Howe?
7 DR. HOWE: Yes, it does.
8 CHAIR MALMUD: As always, thank you for a
9 very stimulating presentation. I believe the next
10 item on the agenda for which we are a bit late, is the
11 Medical Uses of Radium-223, which Dr. Welsh is going
12 to tackle for us. Do you want to do that now, or do
13 you want to take a break now?
14 MS. COCKERHAM: Yes, you guys are
15 scheduled for a break. You want to come back at like
16 10:15, or so.
17 CHAIR MALMUD: Okay. So, we'll reconvene
18 -- it's 10:05. Can we reconvene at 10:20? Thank you.
19 (Whereupon, the proceedings went off the
20 record at 10:02:04 a.m., and went back on the record
21 at 10:24:31 a.m.)
22 CHAIR MALMUD: Ladies and gentlemen, if we
23 may, we'll reconvene. We are running a little bit
24 late, and as soon as we get together, we'll move on.
25 The next item on the agenda is a

1 presentation by Dr. Welsh regarding the Medical Uses
2 of Radium-223. Dr. Welsh.
3 MEMBER WELSH: Thank you, Dr. Malmud.
4 Today I'm just going to talk briefly about
5 new applications or Radium, specifically, Radium-223,
6 which may become available in the United States for
7 palliative therapy sometime in the near future, if all
8 goes according to plan. I'm going to restrict my talk
9 today to palliative therapy, but as many of you know,
10 this isotope has potential very interesting
11 applications that might go beyond palliation.
12 So, just in the way of background, Radium
13 is the heaviest of the alkaline earth elements, and,
14 therefore, the chemistry is very similar to Barium;
15 thus, the famous experiments by Otto Hahn and Fritz
16 Strassman, which they won the Nobel Prize for
17 chemistry, in which they extracted Barium, when they
18 were expecting Radium. It was discovered in 1898 by
19 Bemont, and, of course, Pierre and Marie Curie. About
20 10 tons of pitchblende was used to isolate less than a
21 gram of Radium. And then used pitchblende, which is
22 an amorphous black pitchy form of the mineral
23 Uraninite, Uranium Oxide, and this is one of the
24 primary mineral auras of Uranium. It contains 50 to
25 80 percent of that element. But there were three

1 chemical elements that were first discovered in
2 pitchblende. The first was way back in 1789, when
3 Uranium was identified by Klaproth, and, of course,
4 Polonium and Radium were also isolated from
5 pitchblende.
6 In terms of basics, we're familiar with
7 the concept of the curie, which one gram of Radium-226
8 undergoes 3.7 times 10 ten to the tenth
9 disintegrations per second. I counted up 33 isotopes
10 of Radium. Some texts say that there is a few less.
11 All of them are radioactive. And, for the most part,
12 their half-lives, with the exception of Radium-226,
13 and Radium-228, which are measured in years, the rest
14 are measured in much shorter time periods.
15 Radium occurs only as a disintegration
16 product in the three natural extant radioactive decay
17 series, specifically, the Thorium series, the 4n
18 series, the Uranium series, the 4n+2 series, and the
19 Actinium series, or 4n+3 series. Radium-226, the
20 familiar form of Radium, is a member of the 4n+2
21 series. Uranium-226 is found in nature as a result of
22 the continuous formation from Uranium-238 decay. And
23 the parent is Thorium-230, daughters Radon-222.
24 Biological effects of Radium were
25 identified very shortly after its discovery.

1 Becquerel only two years after the discovery of
2 Radium, developed a skin ulcer after carrying a small
3 ampule around in his pocket for a number of hours.
4 Marie Curie developed a skin ulcer, also, after a few
5 days following 10 hours direct contact with a small
6 sample.
7 In 1903, the Radium craze began, and there
8 were a number of absurd products that became
9 available. The Cosmos Bag used for arthritis, so-
10 called Liquid Sunshine, Radiathor, and all this ended
11 with the sad case of steel magnate, Eben Byers' death
12 in 1932. He consumed approximately 1,400 bottles of
13 Radiathor, and the Wall Street Journal article says it
14 all. "The Radium water worked fine until his jaw came
15 off."
16 And then, as if that wasn't enough, we are
17 all familiar with the story of the Radium Girls, the
18 U.S. Radium Corporation. The luminous paint for watch
19 dials contained a small amount of Radium, consisting
20 of Radium Bromide and Zinc Sulfide. The Zinc Sulfide
21 glows out to alpha radiation. Eight hundred employees
22 -- of 800 employees, 48 developed radiation sickness,
23 including a couple of cases of mandibular necrosis,
24 and 18 of these people died, including cases of
25 osteosarcoma.

1 So, how could there possibly be any
2 interest in Radium today, after that wonderful
3 background? Well, as I said, Radium-226 is part of
4 the 4n+2 series, the Uranium series. The Thorium
5 series, or the 4n series, has two Radium isotopes that
6 are found naturally in some abundance in Monazite, but
7 it's the fourth isotope that I'm going to talk about
8 here, Radium-223, which occurs in the 4n+3 series.
9 So, Radium-223 is the isotope of interest.
10 It has a number of radiological properties that make
11 it well suited for radiopharmaceutical applications.
12 And there is some compelling clinical data that is
13 emerging, suggesting its got a potentially important
14 role in the palliation of bone metastases.
15 Here's a table of some of the common
16 isotopes of Radium. We see Radium-223 is an alpha
17 emitter, which is not commonly used in radiation
18 therapy, or nuclear medicine at this stage. It's got
19 a half-life of 11.4 days, and decay energy
20 approximately 6MeV. Here's where it sits in this
21 decay scheme, with isotopes being horizontally
22 arranged, and isobars being on the diagonal. Here's a
23 more specific decay scheme of the Radium-223 ending in
24 Lead-207 through a series of alpha and beta decays.
25 Radium-223 is a bone-seeking radioisotope,

similar to Strontium. Now studies have shown a bio distribution similar to Strontium-89, and that means that it accumulates in the skeletal matrix with retention in osteoblastic lesions. The first report on the use of Radium-223 goes back about 40 years, with a biokinetic bio distribution studies using tracer amounts for the purposes of establishing radiation safety assessments. Dose modeling suggests that a significant reduction in marrow irradiation might be possible with this isotope when compared to Strontium-89.

It is a bone-seeking isotope, similar to Strontium-89, and Samarium-153 EDTMP. And we know that these two beta emitters, MetaStron and Quadramet, their trade names, are effective, but their clinical use is hampered by myelosuppression. And they may be under-utilized because of this reputation of damaging the marrow. And, thereby, interfering with the ability to give additional chemotherapy.

Well, Radium-223 is an alpha emitter, which -- with an energy of 5.99 MeV is high LET. And, in principle, could be potentially more effective at killing tumor cells, as well as less myelosuppressive due to the relatively modest range of the alpha particles.

1 As I mentioned, it's got a half-life that
2 is suitable for therapeutic applications. At 11.4
3 days, it rapidly decays into a stable form of Lead.
4 And it does emit photons that might be suitable for
5 imaging, 81 KeV at 15 percent, and 84 KeV at 25.6
6 percent.
7 I don't have the bone scan here to show
8 you. Frankly, it's not a beautiful bone scan. I
9 wouldn't say it compares with Technetium-99M and MVP,
10 but you can see skeletal outline with this isotope.
11 Back in 2002, Hendriksen and colleagues
12 showed an effective anti-tumor effect in a rodent
13 model of metastatic breast cancer, and did not show
14 much in the way of myelosuppression. At 67 days, two
15 of the five animals treated with more than 100
16 kilobecquerel per kilogram survived, where none of the
17 controls did. And then in a Phase I trial led by
18 Nilsson and colleagues, published in 2005, a single IV
19 administration with activities ranging from 50 to 250
20 kilobecquerel per kilogram was administered to 25
21 patients with bone metastases from breast or prostate
22 cancer. Only three of them developed Grade 3
23 Leukopenia, and no patients had more than Grade 2
24 Thrombocytopenia, which compares favorably to what
25 would be expected with the beta emitters. There was

1 improved pain scores at all doses. The alkaline
2 phosphatase was also reduced at all doses
3 administered, and 50 kilobecquerel per kilogram was
4 the dose selected for further studies.
5 So, at Phase II, randomized multi-center
6 placebo-controlled study was conducted, published in
7 the Lancet Oncology by Nilsson and colleagues, 64
8 patients with hormone-refractory prostate cancer were
9 treated, about 31 to 32 in both groups. And the dose
10 was 50 kilobecquerel per kilogram every four weeks for
11 four administrations.
12 The primary endpoints were bone alkaline
13 phosphatase levels, skeletal-related events, and
14 secondary endpoints were toxicity timed to PSA
15 progression, and overall survival. There was a highly
16 significant reduction in the median relative change in
17 alkaline phosphatase. There was no difference in
18 toxicity in two arms. Median time to PSA progression
19 was also significantly altered. And the hazard ratio
20 for overall survival proved to be significant, as
21 well.
22 So, there have been other studies in which
23 the biodistribution and tumor uptake of liposome-
24 encapsulated Radium-223 in mice and human
25 osteosarcoma, xenographs in dogs with spontaneous

1 osteosarcomas have been evaluated, and the results are
2 promising in terms of the biodistribution in both
3 species. And, collectively, the data suggests that
4 there's an outstanding potential for Radium-223 as a
5 therapeutic agent that might be beyond just
6 palliation.
7 So, as far as future in the United States,
8 there is now a Phase -- there's a Phase III placebo-
9 controlled study that's ongoing in the United Kingdom.
10 And Algeta, I think, has partnered with Bayer or
11 sold their product, and how it's pronounced,
12 Alpharadin.
13 (Off mic comment.)
14 MEMBER WELSH: Okay. That agent, is now
15 with Bayer. And that means that there's possibility
16 of it becoming available in the United States. And, I
17 guess we'll have to keep our eyes and ears open for
18 whether or not those clinical trials open here in the
19 USA, and whether we can participate. And I know that
20 while reviewing this subject, I came across a couple
21 of papers that were co-authored by one of our ACMUI
22 members, Dr. Fisher, so I would ask Dr. Fisher for any
23 comments also on this topic that I might not have
24 covered. Otherwise, thank you for your attention.
25 CHAIR MALMUD: Thank you, Dr. Welsh. Dr.

1 Fisher, you've been invited to make a comment.

2 MEMBER FISHER: Yes, thank you. I helped

3 author the papers that you cited. My small role is

4 dosimetry. And I think what's interesting about

5 Radium is that it's also less expensive, and more

6 available than the other alpha emitter choices for

7 therapy. To use it in the broader context of a

8 clinical setting, one needs to conjugate it to cell-

9 directed targets, and that is being worked on at the

10 present. So, while we see that the treatment of

11 metastases from prostate, breast cancer, and lung

12 cancer is the primary first use, I think other

13 therapeutic applications are forthcoming.

14 One interesting one was the use of the

15 parent, Thorium-227 chelated with Doda, conjugated to

16 an antibody for targeting solid tumors, or even

17 Leukemia, where Thorium-227 serves as an in vivo

18 generator for Radium-223. There were at least eight

19 papers on this at the S&M in Toronto, or various

20 subcategories of the same concept. So, it looks like a

21 very interesting therapeutic agent for not only bone

22 cancer metastases, but also other forms of cancer in

23 the future. And I thought you did a very nice job of

24 giving an overview on this.

25 CHAIR MALMUD: Thank you, Dr. Fisher. Dr.

1 Howe.

2 DR. HOWE: I guess NRC has one overriding
3 question, and that is, is it something we would
4 regulate? If it's coming totally by natural products,
5 raw material, we wouldn't regulate it. Is it
6 something that you enhance its production through
7 accelerators or anything?

8 CHAIR MALMUD: Dr. Fisher.

9 MEMBER FISHER: That's a really good
10 question. I think it is regulatable, because the way
11 you produce it for clinical use is you put Radium-226
12 in a nuclear reactor, and turn Radium-226 into Radium-
13 227, and beta decay to Actinium-227, which decays to
14 Thorium-227, and Radium-223, and then on down the
15 chain. So, I suspect -- it is a natural existing
16 material, but the Radium-223 that is used is created
17 through reactor -- as a reactor byproduct.

18 DR. HOWE: Okay. Thank you.

19 CHAIR MALMUD: Dr. Eggli.

20 MEMBER EGGLI: Just sort of editorial
21 comment on where I might see the use of this in a
22 clinical practice. Given the short range of the alpha
23 in tissue, this looks like it has potential as a
24 treatment for micrometastases that are not otherwise
25 yet clinically apparent. And, as we make steps

1 forward in the treatment of cancer, clearly, where
2 we're going to have the biggest impact is in the
3 treatment of non-clinically apparent micrometastases.
4 As we deal with the big tumors, and remove them, and
5 the patient has no evidence of disease, we always
6 wonder about the micrometastases that we can't find.
7 And this seems that this has great potential in the
8 revolution of cancer treatment, if you can target an
9 effective treatment to micrometastases. So, I hope
10 the research continues.
11 CHAIR MALMUD: Thank you for your comment,
12 Dr. Eggli. Are there other comments, or questions?
13 If not, thank you for keeping us informed, Dr. Welsh.
14 We look forward to hearing more about Radium-223 in
15 the future.
16 Do I recall the reason that the Radium
17 handlers developed bone cancer was that they were
18 putting the tip of the brush on their tongues with the
19 Radium Zinc Sulfide?
20 MEMBER WELSH: Yes, that's my
21 recollection, as well. And I think, according to some
22 accounts, it was quite obvious that they had very
23 significant burden of Radium in their bodies, and in
24 their skeletons. In some interpretations, this is
25 viewed as evidence of a threshold for osteosarcoma.

1 Although, of course, that is highly debated, but it is
2 often quoted as one tangible example.
3 CHAIR MALMUD: And what happened to all
4 those Radium-painted wristwatches that we had as
5 children in my generation?
6 MEMBER WELSH: Well, I know that some
7 people have brought them to the Cancer Center and
8 donated them to the radiation oncologist, but I can't
9 account for all of them.
10 CHAIR MALMUD: Can the NRC account for
11 them?
12 MR. LEWIS: Debbie could probably weigh
13 in, but every -- well, once a year some old jeweler
14 passes away, and their children inherit the family
15 house, and we found out the basement is full of
16 Radium. And it's an ongoing issue, well-known to NRC
17 and the states.
18 CHAIR MALMUD: Dr. Eggli.
19 MEMBER EGGLI: In my department, we have a
20 collection of naturally occurring radioactive objects
21 that we use as training tools. The wristwatch with a
22 Radium dial is the second most radioactive. The third
23 most radioactive was a Thorium mantel from a Coleman
24 lantern. And the very most radioactive was a plate of
25 Fiesta Ware which was painted with orange Uranium

1 Oxide paint.

2 CHAIR MALMUD: Thank you very much. We'll
3 move on to the next item on the agenda, and that is
4 Dr. Suleiman, who will provide us with a brief
5 overview of the Role of the FDA regarding Regulatory
6 Responsibilities of the U.S. Food and Drug
7 Administration. Dr. Suleiman.

8 MEMBER SULEIMAN: Yes. Thank you. I've
9 been there for 30 years, and I'm still trying to
10 figure out all our regulatory responsibilities.

11 Actually, I was going to mention the --
12 before I say "we", I'm very excited. Some of my
13 colleagues at the Agency are very excited about alpha
14 emitters. I've been hinting at it at this Advisory
15 Committee for many years, that I think you can see in
16 the pipeline, you can look in the literature. One of
17 the benefits of Bexxar and Zevalin, which have been
18 approved by the Agency a few years ago, they're,
19 essentially, beta emitters, and they have much less
20 side effects than conventional agents. And the alpha
21 emitters would even have less side effects. And,
22 obviously, dosimetry is a major, major challenge. And
23 the drug is chemically very challengeable. And there
24 are, clearly, radiation issues. And yes, Donna Beth,
25 I think I can say pretty competently, it's going to be

1 regulated by the NRC, as well as us. So, we're
2 excited, but let me give you an overview.
3 (Off the record comments.)
4 MEMBER SULEIMAN: Basically, back in 1906,
5 the Food, Drug and Cosmetic Act was passed. There was
6 a lot of media attention with foods, and the law has
7 been amended many, many times. I mean, you can
8 discuss this in great depth, but every few years,
9 Congress comes up with another round of amendments to
10 the FDA. And it incorporates a variety of laws that
11 have been passed separately over a period of time.
12 Some of the ones that impact on radiation
13 products is the Radiation Control for Health and
14 Safety Act of `68, the Medical Device Law of `76, and
15 since then we've had the more recent ones, FDA
16 Modernization Act, we refer to as FDAMA, and FDA
17 Authorization Act, which was passed in 2007.
18 There are several major centers in FDA. I
19 currently work in the Center for Drug Evaluation and
20 Research. They, primarily, regulate
21 radiopharmaceuticals. We got involved with the
22 medical isotope shortage issue, because we have a Drug
23 Shortage Group, and we got plugged into that far more
24 intensively than I had cared to get involved with.
25 CDRH, historically, has been involved with

1 the vast majority of radiation products, accelerators,
2 brachytherapy sources, and so on. The Center for
3 Biologics, blood and vaccines, actually, they approved
4 the Bexxar and Zevalin products I had mentioned
5 earlier. Since then, they've been moved over to the
6 Drug Center, because those are monoclonal antibodies,
7 which were regulated by CBER, but the therapeutic
8 applications -- the cancer therapeutic applications
9 have all been moved over to the Drug Center.
10 CDER has about two to three thousand
11 people. We've undergone major expanse the last few
12 years. CDRH has between one and two thousand. CBER
13 has a couple of hundred people. CFSAN, Center for
14 Food Safety and Nutrition regulates -- guarantees food
15 safety. They regulate, also, food irradiators, but
16 the other issue they get involved with is if the food
17 were to be radioactively contaminated, the other
18 federal agencies would come to us to declare whether
19 it was, in fact, safe for human consumption. So,
20 that's our big role in terms of emergency response.
21 There's a few smaller components, Center
22 for Veterinary Medicine, National Center for
23 Toxicological Research, which is actually located in
24 Arkansas. Our two most significant components are the
25 Office of Regulatory Affairs. That's our field

1 operation, numbers about 4,000 or so people throughout
2 the country and the world. We just opened some
3 international offices. And the Office of the
4 Commissioner, which basically runs the Agency.
5 I'll briefly review some of the products,
6 and some of the statutes. CDRH, as I said, has the --
7 regulates medical devices. The critical office in
8 CDRH is an office known as Office of Device
9 Evaluation. They do what we refer to as pre-market
10 approval. We regulate the marketplace, so before
11 anything is allowed to be sold, and they're making a
12 medical claim, it has to be evaluated, cleared,
13 reviewed by the Center. And the analogous office in
14 the Center for Drugs is called Office of New Drugs.
15 And some of the terminology changes, basically, nobody
16 can make any medical product that makes a medical
17 claim, has to be reviewed ahead of time.
18 Up until the early `60s, FDA basically had
19 very limited pre-market, if any, regulatory authority.
20 We, basically, chased after products that were making
21 false and misleading claims. And it was only after
22 the Thalidomide disaster that Congress gave us the
23 authority to require pre-market review.
24 Radiation-emitting products cover cellular
25 phones, microwave ovens, x-ray, a whole slew of

1 electronic products that emit radiation. That dates
2 back to the `68 law, and that's in CDRH's Office of
3 Communication, Education, and Radiation. And the
4 Mammography Act, the MQSA, which was passed in `92, is
5 also regulated by OCER. So, you have a broad range of
6 products.
7 The three statutes, again, that affect
8 CDRH were passed in `68, `76, and `92. One of the
9 unique features of the Radiation Act is that it allows
10 for mandatory performance standards. So, microwave
11 ovens, any microwave oven that's sold in the country
12 must meet - and if you look behind the console, you'll
13 see it says complies with 21 CFR, such and such, and
14 so and so. So, lasers have a whole slew of
15 requirements. There are also performance standards
16 for medical and security products.
17 I have to -- I want to dwell on this just
18 a little bit, because there is a tremendous amount of
19 confusion out there. And this is just for medical
20 devices. I'll get over to the drug side in a few
21 minutes. Basically, you hear this term "510-(k)".
22 Basically, when the law was passed in 1976, any
23 product that was already out there was, essentially,
24 grandfathered in, so all a medical product
25 manufacturer would have to do is say -- they'd have to

1 fill out this form, and it's called 510(k) because it
2 is what -- is the part of the statute that addresses
3 this. And say this product, an x-ray system. It was
4 around before 1976, so it -- we just want to
5 demonstrate that it's substantially equivalent. And
6 they have to answer some basic questions. But it's,
7 essentially, or used to be pretty much a rubber stamp-
8 type procedure.
9 Also, we've classified products into three
10 classes, I, II, and III. I, where you -- because
11 tongue depressors, for example, come under -- are
12 considered medical devices, where they minimal
13 controls, where we really don't worry about them.
14 Class II, special controls, and Class III are high-
15 risk devices, and may require pre-market approval,
16 which we call a PMA, and may require clinical trials.
17 But it varies a lot, depending on the product when it
18 originally was introduced into commerce. So,
19 understanding these sometimes is very product-
20 specific, and changes over time. So, the reason you
21 don't always get a simple answer is because the
22 questions are not always very obvious.
23 The MQSA Act, which really was the closest
24 thing to regulating process, covered mammography, and
25 it addresses quality control of equipment, periodic

1 testing. It addresses credentialing. Our other
2 products don't address the user of the products. We
3 trust the physicians, we trust the community that's
4 using them, but with mammography, we actually require,
5 for example, the interpreting physician must read 240
6 mammographs every six months, and RTs have
7 qualifications, as do medical physicists. And the
8 imaging equipment is actually assessed in terms of
9 performance, so there's a phantom that addresses some
10 imaging criteria, and addresses some dosimetry issues.
11 So, it really covers the entire gamut.
12 And I'm going to use this as a soap box,
13 because when I went over to Drugs -- well, with
14 mammography we realized you needed to have a phantom,
15 and this phantom on the right is one that we adopted,
16 the ACR uses it in its accreditation program. And
17 there are a bunch of test objects that have to be
18 imaged. If the mammography equipment fulfills the
19 task, and the radiation dose, it's also dosimetry
20 phantom. If the radiation dose meets a certain
21 amount, then it's okay. It passes. And you can't use
22 people because human anatomy varies over time, and
23 whatever.
24 When I got involved with the drug trials,
25 I went over to the Center for Drugs, and I got

1 involved with imaging-based drug trials, and I thought
2 I was dealing with the best and the brightest. So,
3 where you're trying to see cancer efficacy, and you're
4 trying to measure tumor size over a period of time,
5 and an awful lot of other imaging endpoints, what I
6 discovered was that a lot of the trials were
7 fundamentally flawed.
8 I was at a drug meeting, and some of the -
9 they call them CROs, Contract Research Organizations
10 that do all the heavy lifting for the drug companies,
11 and I said what kind of phantoms do you use? This was
12 an imaging-based CRO, so I thought I'd talk some shop
13 with them. And they said we don't use phantoms, we
14 use patients. So, how can you demonstrate that these
15 changes over time are, in fact, due to the effect of
16 the drug? So, I've been on a personal crusade
17 internally, and it's gained some traction. And pharma
18 is a very different beast than the other industries we
19 interact with, so it's been fascinating. They're
20 eager to learn, but they're also eager to tell you how
21 it ought to be done. So, there's been some benefit
22 there.
23 This is just something I had put together
24 a while ago. Early in the `70s and `80s, we knew that
25 radiation doses from mammography were pretty high, and

1 so there was a big public effort by the professional
2 societies, industry, film companies, to reduce the
3 doses. These doses were, basically, a direct film
4 dose, and doses were on the order of 1400 millirads.
5 And they came down, as the community shifted to
6 faster, or lower radiation dose technologies, film
7 screens, xerox, and now you're seeing a lot of digital
8 imaging.
9 And this was the image quality. We
10 learned earlier with mammography, you couldn't just
11 reduce the dose. At some point, the image quality,
12 the efficacy was a critical part, so we had a metric
13 that we tracked, and was very important in the overall
14 program. And in `92 is when, essentially, all these
15 forces -- this is where a lot of people were doing it
16 right. The American College of Radiology had a
17 voluntary accreditation program. It was a very good
18 program. It was voluntary. And, eventually,
19 Congress, advocate groups came together and people
20 said why don't you apply this to other imaging
21 technologies? Well, it's not our decision, it was
22 Congress', and Congress passed the MQSA Act. And it
23 was embraced pretty much across the board. But it's
24 not something that's been really applied to other
25 modalities.

1 Shifting back over to the Drug Center,
2 most radiopharmaceuticals are either drugs, or
3 biologics. The vast majority of the
4 radiopharmaceuticals now are regulated by CDER.
5 Now, the point I wanted to focus on here
6 is what does it take to get a drug approved? There
7 are two hats that FDA wears, and people don't ever
8 appreciate the first one. The first one, we're
9 supposed to protect human research subjects. You
10 cannot conduct any sort of research on any people in
11 the United States unless you -- if it's a drug, unless
12 you do it under and investigation of a new drug
13 application. And you always hear the terms Phase I,
14 Phase II, Phase III. And, basically, a Phase I is a
15 safety trial. And it doesn't apply much to
16 radiopharmaceuticals, imaging pharmaceuticals, but it
17 does apply to therapeutic pharmaceuticals.
18 But, basically, you want to know how much
19 is too much. So, you basically escalate the dose, and
20 you determine how much is safe. And then you worry
21 about efficacy until you get into the Phase II trials,
22 which usually require a few hundred human subjects.
23 That's where you want to demonstrate that this product
24 actually has some sort of benefit medically. And the
25 end of Phase II trials, we have a big meeting with the

1 sponsors, usually the drug companies, and they present
2 their Phase III protocols. And these are large-scale
3 studies that address risk, that address dosing. And,
4 usually, these are completed in a few years. Contrary
5 to all the business about it takes eons to get a drug
6 approved, a lot of the pre-clinical, a lot of the
7 animal research, and a lot of the early research takes
8 sometimes five, ten years, when they come to us, it
9 usually doesn't take but a couple of years to get the
10 product researched and approved, or not approved.
11 Now, the other thing that people are never
12 aware of is, we're also focused on manufacturing. And
13 this raises a lot of anxiety, because once the product
14 is approved, we want to be sure that it's manufactured
15 in a consistent and safe way. So, what I call quality
16 control for devices, I call CMC, Chemistry
17 Manufacturing Control on the drug side. So, we're
18 pretty -- we can be pretty picky on these issues. And
19 it's our field operations, they go in and it's -- they
20 take manufacturing very, very seriously.
21 Now, I had mentioned pre-market approval
22 for medical devices. For drugs, you do the research,
23 you collect it. You can take forever as far as we're
24 concerned. Then you decide you're going to apply for
25 a new drug application. Now, right now, I think the

1 application for a NDA is over $1 million, and you can
2 get exempted if it's what's called an orphan product,
3 where it's used on a much smaller population. But,
4 basically -- and we have to, from the time the
5 application is submitted, and we -- there's usually a
6 short period of time we have to tell the applicant
7 that it's of quality to be considered or not. But
8 then we have to make a decision within six months.
9 Sometimes that could drag out to nine months,
10 depending on whether the quality of the submission is
11 appropriate. But once they submit to the NDA, it's
12 got to be resolved relatively quickly.
13 And another area I've been very much
14 involved, again, is the research phase. We actually
15 realized a few years ago that radiopharmaceuticals
16 don't all, necessarily, require an investigation and
17 new drug application. They do it under what we call
18 this Radioactive Drug Research Committee. And it
19 allows research to be done by these committees at
20 medical institutions. If the research is basic,
21 meaning it's not for development as a diagnostic or a
22 therapeutic agent, if the Committee approves the
23 protocol, we don't, necessarily, want to look at the
24 protocol. And there's no -- there are certain
25 radiation dose limits that are met, and this involves

1 organ dose calculations, and they're capable of doing
2 this. And there's no clinically detectible
3 pharmacological effect from the drug itself, you're
4 administering such a small quantity of the drug that,
5 basically, there's no safety issue with that. So, as
6 long as they meet these criteria, and there's other
7 requirements, administrative and record keeping
8 requirements, as long as they meet those, we sort of
9 keep our hands off, and allow these committees to
10 operate independently, with strong oversight. We do
11 review their annual reports. We review their annual
12 reports on an annual basis, and we can go in and
13 inspect, and do other things to keep them honest.
14 So, manufacturing responsibility for
15 medical products are isotopes, I threw these up here
16 just for reference purposes. For pharmaceuticals, we
17 have what's called Good Manufacturing Process. The
18 PET CGMPs are going to be in Parts 212. I know Steve
19 is excited about those, not as much as we are. That's
20 a tragic example of regulatory slowness. It involves
21 a Supreme Court ruling, it involves some other issues,
22 and for a variety of issues, we don't -- and the
23 community is eager for PET drugs. The Agency looks on
24 PET production, even though it's very local, as
25 manufacturing, so they're subject to manufacturing

1 regulations.

2 An aside, I don't know how many of you

3 would appreciate this, because I learned this. I

4 didn't understand the difference between compounding,

5 which the pharmacist does, and manufacturing. And one

6 of my pharmacist friends said if people are -- the

7 physicians are requesting so many drugs, we'll prepare

8 for them. Sometimes you may anticipate a lot more, so

9 you'll prepare for them. When a pharmacist starts

10 compounding lots and lots of dosages, and starts

11 selling them, or soliciting them, at some point you

12 cross that threshold. Well, the GMP -- the

13 manufacturing regulations are much more stringent.

14 So, that's where there's been some issues, and

15 concerns. For whatever reasons, the Agency looks on

16 PET drugs, despite their short-lived nature, as

17 manufacturing. So, we're promised these regulations,

18 and we're waiting for them, as well as you are. They

19 have to clear the upper echelons of the government.

20 Medical device, also quality -- what they

21 call our Quality Systems Regulations. These are all

22 very similar; record keeping, periodic testing on

23 various components in the manufacturing cycle. And we

24 also have an office called Office of Combination

25 Products, that now when you have products that both

1 have a device or a drug nature to them, they have to
2 be registered, and the lead agency identified.
3 And I threw -- this slide is really more
4 for my FDA colleagues, but I decided to leave it in
5 here, because the term "licensing" comes up. FDA does
6 not license radioactive materials. Obviously, the NRC
7 and the agreement states do. However, FDA does
8 license some products. It's licenses biological
9 products. Just like the pre-market approval for
10 devices, and the New Drug Application for drugs,
11 biological products, like the vaccines that we all
12 should be getting, have to be approved under a
13 biological licensing application. So, that's it.
14 I could have gone into an awful lot of
15 more detail on any of those subjects, but I figured
16 I'd finish early, and answer questions, as they come.
17 I did have a slide that I couldn't project
18 here on the CT exposure, so if you have any questions,
19 that has made the news recently, but it's something
20 that's, apparently, still under investigation. But
21 the only thing I can say is, you never know, what you
22 hear initially may not always be what happens when the
23 whole thing is investigated, lying the flying saucer
24 balloon. So, I'd wait until the investigation is
25 completed, but I think it's 206 patients were started,

1 who were being treated with CT brain profusion study,
2 started to show hair loss. And that adverse event, we
3 don't call them medical events, we call them adverse
4 events, was actually reported, and the whole thing
5 unraveled. So, like I said, that's been in the news.
6 Anyway, any questions?
7 CHAIR MALMUD: Are there any questions for
8 Dr. Suleiman? If not, we thank you for a very
9 informative presentation regarding the FDA. The FDA
10 and the NRC complement each other.
11 MEMBER MATTMULLER: If I could make a
12 comment, said the Staff at the NRC, if ever you think
13 you're being picked on for slow response, you can
14 always hold up FDAMA 1997 as an example of how quickly
15 the FDA operates, because the PET CGMPs were supposed
16 to be in place by 1999, I believe. So, you're pretty
17 close.
18 MEMBER SULEIMAN: It's not the first
19 mandatory deadline we haven't met.
20 (Laughter.)
21 MEMBER SULEIMAN: And it probably won't be
22 the last.
23 CHAIR MALMUD: All right. If we may,
24 we'll move on to our deadline with Item 17. Oh, is
25 there another comment? I'm sorry.

1 COURT REPORTER: Speak into the
2 microphone.
3 CHAIR MALMUD: Oh, thank you. We'll move
4 on with our own deadlines, and hear the next
5 presentation from Dr. Eggli, who will give us a few
6 final words about his experience on the ACMUI.
7 MEMBER EGGLI: Thank you, Mr. Chairman.
8 When I was first appointed to this
9 Committee, I had absolutely no idea what I was getting
10 myself into. Ashley asked me if I wanted to use
11 slides today, and I said no, but what I probably
12 should have said is I don't think anything I'm going
13 to say is memorable enough to be rendered to slides.
14 But, joining ACMUI seven years ago, I made several new
15 friends. And that's one of the things that this
16 Committee does, is cement some lifelong friendships.
17 In that time, not one of those people I
18 started with is still here. But I've made new friends
19 in the last seven years that I will take with for the
20 rest of my life. I think it takes a while to learn
21 the regulatory process. For new people on the
22 Committee, although you may have opinions to share
23 relative to your expertise, unless you have a strong
24 regulatory background, it's going to take a while to
25 learn the process, at least it took me a while to

1 learn the process. The regulatory process, I think,
2 is both slow, and complex. It has a unique set of
3 rules, and its own vocabulary, which doesn't translate
4 into ordinary English. So, it takes a while to learn
5 that, and to make more than just a technical
6 contribution, but make a contribution to the
7 regulatory process.
8 At my first ACMUI meeting, I think I
9 learned that this not the place to fight a turf
10 battle. Turf battles are won and lost on a completely
11 different playing field. In my everyday clinical
12 practice, I fight, and either win, or lose turf
13 battles, but this Committee is not the place to fight
14 turf battles. Turf cannot be protected for any
15 significant period of time via regulation. It just
16 doesn't happen.
17 So, what I think we do here is, we bring
18 our expertise to bear on questions of public interest.
19 Our professional experiences inform the discussion,
20 and each one of us, in theory, comes from a different
21 professional background, so we each bring something
22 different to the discussion, which informs that
23 discussion, and, hopefully, then provides a better
24 quality recommendation to NRC Staff.
25 However, even though Dr. Fisher is the

1 official patient advocate, I see our primary
2 responsibility here in this Committee, each and every
3 one of us, as patient advocate. Our task is to make
4 sure that materials-based diagnostic and therapeutic
5 procedures are widely available to support public
6 health, and well-being. And this should be done in an
7 environment that protects safety both of the patient,
8 and the public. And that's where the balance has to
9 be created, and that's where all of -- a big chunk of
10 the discussion revolves.
11 NRC, again, strives to create risk-
12 informed regulation. Part of our task is to help NRC
13 understand where the diagnostic procedures, or
14 therapeutic procedures that employ radioactive
15 materials fit in the risk versus benefit spectrum.
16 Everything has a risk, everything has a benefit,
17 somewhere there's a tipping point where the benefit is
18 no longer supported by the risk. And there's also a
19 tipping point where below a certain level of risk, the
20 benefit is obvious. And that's what, I think, we help
21 to inform the discussion. Lower risk procedures,
22 obviously, require less regulation. In my background
23 as a clinical nuclear medicine physician, I sit at the
24 low end of the risk spectrum, and that probably colors
25 my opinion of the risk benefit discussions.

1 I think we are most effective when we work
2 collaboratively, and develop a consensus. I won't
3 hold up the last vote that we had as an example of
4 consensus, but I think that's when we're most
5 effective. A Supreme Court decision of 9-0 sets a
6 clear precedent. A Supreme Court ruling of 5-4 says
7 the issue is unresolved, and it's going to be back
8 again another day.
9 I think the same is true for our ACMUI
10 recommendations. A variety of opinions and points of
11 views are critical to inform the discussion. But, at
12 the end, we need to close ranks, and make a consensus
13 recommendation that is in the interest of patients,
14 and good healthcare.
15 It is difficult to argue that the expense
16 and time to change a rule should be undertaken on a
17 split recommendation. Because what that, to me, says
18 is that we really don't have a uniform opinion, and
19 why spend millions of dollars, and two or three years
20 worth of time to implement a rule on something that we
21 haven't agreed upon, just to have it changed at a
22 later date. So, I think that the more -- as Chris and
23 Rob say at the beginning of every meeting, our goal
24 should be to arrive at a consensus.
25 All of us are probably impatient by

1 nature. I know that I am. But progress if often
2 incremental, and I think that it's wise to accept what
3 you can accomplish now, and come back to discuss and
4 debate another day. It may be another rulemaking
5 cycle before the process is done, or it may be two or
6 three rulemaking cycles before you end up at an
7 endpoint. But incremental progress is still progress,
8 and I think should be viewed with a sense of
9 accomplishment.
10 The other thing is, we have to make our
11 case. I watch politics all the time. I'm a political
12 junkie. And I listen to a politician make a beautiful
13 and elegant speech, occasionally they do, and then I
14 listen to the press afterwards saying they haven't
15 made their case. And I say, what do you mean they
16 haven't made their case? Look at this. Well, I think
17 the question is, the definition of making your case.
18 It is one thing to make an elegant intellectual
19 argument and support it with fact. It is another
20 situation all together to create a high level of
21 comfort that what you're doing is the right thing.
22 And I think that's a key part of making your case, is
23 making everyone comfortable with the pathway you're
24 embarking upon. And that's why I think after a
25 beautiful intellectual argument laid out, the press

1 will often say well, he hasn't made his case yet. So,
2 our job in making our case is not to just present the
3 arguments, but present them in a way that the
4 regulatory agency can be comfortable with the approach
5 that we're advocating. And that's what I think making
6 your case is.
7 The staff have to be comfortable. And,
8 ultimately, the Commissioners have to be comfortable
9 that we're taking a reasonable and appropriate path.
10 So, making our case means making people comfortable
11 that we're heading down the right path.
12 Over the last few years, NRC has developed
13 an emphasis on the concept of a culture of safety.
14 And Leon touched on some of this earlier, and stole a
15 little bit of my thunder here. And if I could have
16 reached under the table, I would have kicked his leg
17 and say don't -- this is what I'm going to talk about
18 later. But, a culture of safety has the airline
19 industry as its primo model. The culture is
20 desirable, and should be both encouraged and rewarded.
21 A culture of safety really assumes that almost all
22 problems are system problems, that there aren't really
23 human errors, but that if the system were improved,
24 the errors would go away.
25 However, there are still airplanes that

1 crash due to pilot error. There is no system that is
2 perfect, but there are systems that can improve. Just
3 yesterday we heard about medical events that cry out
4 for a better system. Yet, we can't bring the error
5 rate to zero with systems alone. There will always be
6 a few human errors. One of the things I was told once
7 is, nothing can be made foolproof, because fools are
8 truly ingenuous people. So, nothing can really be
9 foolproof.
10 In the medical events arena, Dr. Howe
11 presented that in I-131 treatments, there were four
12 medical events last year. If you look at the
13 denominator for administrations of doses greater than
14 30 microcuries, I don't have good data, but the N on
15 the denominator is in the at least tens of thousands,
16 so the error rate is very small. And as you look at
17 systems approaches, you have to determine whether a
18 very small number is simply noise in the system, or if
19 a systems approach can really improve that.
20 If a systems approach is created that is
21 perceived as complex, or onerous, people will find a
22 work-around. And as a result of that work-around,
23 more errors will occur. So, you reach a point in
24 systems approaches where you can actually create more
25 errors, than you reduce, because the system you have

1 created is either perceived as too difficult, or too
2 onerous to comply with. So, part of, again, what the
3 Committee needs to do in looking at medical events is
4 achieve that balance between a clear-cut case, where
5 an improved system would make improvements, and the
6 case where we're at the point where you can't get any
7 better than you're at. And, unfortunately, we've had
8 several airline tragedies this year, that were human
9 error in an industry where systems are about as
10 sophisticated as they could be made. So, human error
11 will continue to occur, and I encourage people to
12 remember that even with a systems approach, human
13 errors will still occur. And part of our role as
14 ACMUI, is to help describe and understand the balance
15 between the improvements that can obtained through
16 systems approaches, and the human errors, which are
17 going to exist at the margin, and that you can't just
18 get by.
19 Finally, over the last seven years, I've
20 seen the relationship between ACMUI and the Staff
21 evolve from probably something grudging, and a bit
22 distrusting, and intermittently confrontational, to a
23 very collegial and collaborative environment. The
24 list of ACMUI recommendations that actually reviewed
25 yesterday demonstrates the overwhelming favorable

1 response by Staff to ACMUI recommendations. Did we
2 get 100 percent? No. Did we do good? Yes, we did
3 good. And sometimes perfect is the enemy of good.
4 And you can't struggle for that perfection, because
5 you and undo the good. And in the relationship that I
6 think the Committee now has with Staff, it is good,
7 and we'll never get 100 percent of what we want. I
8 think we can all bask in the light of the good results
9 that have been achieved through the input of this
10 Committee.
11 Finally, I'm grateful for the opportunity
12 to have participated, and wish you all good fortune
13 moving forward. And I'm sure that collectively, you
14 will help to create that good fortune.
15 (Applause.)
16 CHAIR MALMUD: Thank you very much, Doug.
17 I speak for the whole Committee when I say that it's
18 been a pleasure working with you, and gaining from
19 your insights, knowledge, and opinions, as we try to
20 achieve the goals and the purposes of this Committee.
21 You've been a wonderful colleague, and we will miss
22 your presence. And we wish you the very best in
23 everything else that you're doing outside of this
24 Committee, and will continue to do.
25 MEMBER EGGLI: Thank you.

1 MR. LEWIS: Now, I would just, on behalf
2 of the NRC Staff, add to the appreciation that Charlie
3 already expressed, and the Chairman expressed in
4 writing, and we know the Committee is losing one of
5 its more vocal members, and someone who remembers the
6 history of the Committee debates, and often interjects
7 that history, and it's very valuable. So, that will
8 be tough to replace, I mean, we have no choice but to
9 go on. But I was -- it's tough to focus all day long,
10 to be honest. But when Dr. Eggli speaks up, I can
11 hear him, because I think that he offers advice to us
12 that is really pragmatic, and really about how this
13 regulatory process that we have down here in the halls
14 of the ivory towers in White Flint really hits the
15 road at the licensee sites. And that is really
16 invaluable, and that's really the epitome of why we
17 have this Committee. So, really appreciate all of
18 your contributions over the years, to me, in
19 particular.
20 MEMBER EGGLI: Thank you.
21 CHAIR MALMUD: Any other comments? If
22 not, we'll move on to Ashley.
23 MS. COCKERHAM: Okay. I'm going to pass
24 around the new 2009 recommendation sheets. We have
25 three new recommendations from this meeting.

1 CHAIR MALMUD: You want the extras?

2 MS. COCKERHAM: Okay. So, if you'll look

3 at Recommendation 9, Dr. Malmud added three temporary

4 members to the Medical Event Subcommittee, and the new

5 members include Dr. Welsh as the Chair, Dr. Langhorst,

6 Mr. Mattmuller, and the existing Subcommittee members

7 still include Debbie Gilley, Orhan Suleiman, and Bruce

8 Thomadsen.

9 For Item 10, the ACMUI recommended

10 deletion of the phrase, "at a medical institution",

11 from 10 CFR 35.490(b)(1)(ii), and 35.690(b)(1)(ii). I

12 could tell you this recommendation will be accepted.

13 Any questions on that?

14 CHAIR MALMUD: I see that.

15 MS. COCKERHAM: Okay. I have a question

16 for Dr. Malmud. Did you vote on that one?

17 CHAIR MALMUD: Yes.

18 MS. COCKERHAM: Was it in favor?

19 CHAIR MALMUD: Yes.

20 MS. COCKERHAM: Okay. Thank you. So, I

21 had nine in favor, and one opposed. I'm sorry, one

22 abstained.

23 VICE CHAIR THOMADSEN: Ten. Yes.

24 MS. COCKERHAM: I had one abstention.

25 VICE CHAIR THOMADSEN: I thought it was --

1 I didn't think that was unanimous. Was that one
2 unanimous at all? I thought it was quite a split
3 decision.
4 MS. COCKERHAM: No, that was the next one.
5 VICE CHAIR THOMADSEN: Oh, that was 11.
6 That's next.
7 MS. COCKERHAM: The next one is 2-5-2.
8 Yes, so this one was nine in favor, and one abstained.
9 Okay. For Item 11, ACMUI recommends
10 revising 10 CFR 35.41(a) by adding Number 3, "If the
11 administration is not in accordance with the written
12 directive, a determination of whether it resulted in a
13 reportable medical event will be made in a timely
14 manner." And this motion did not pass. There were
15 two in favor, which I have Dr. Malmud, and Dr. Eggli,
16 there were five opposed, I have Dr. Thomadsen, Dr.
17 Fisher, Ms. Gilley, Dr. Langhorst, and Mr. Mattmuller,
18 and I have two abstentions, Dr. Welsh, and Dr.
19 Suleiman.
20 CHAIR MALMUD: That is correct.
21 MS. COCKERHAM: Okay. So, those are the
22 only recommendations. Any other comments on these?
23 CHAIR MALMUD: Are there any comments from
24 any members of the Committee regarding these issues?
25 I see none.

MS. COCKERHAM: Okay. The next item is just a reminder that your travel vouchers will need to be submitted when we leave the meeting. Shayla will email you those, and she'll send examples, just like I always have. If you took the train, or if you flew, or if you bought your own flight, how to fill out that form, so you'll mail those back to Shayla, and she'll process those for you.

MEMBER EGGLI: Is the deadline for that this Friday, or next Friday? Where are we in the cycle?

MS. COCKERHAM: It's not time. Travel vouchers aren't due by time. I would typically give you 10 business days to complete your travel vouchers.

MR. LEWIS: I'm sorry.

CHAIR MALMUD: Rob?

MR. LEWIS: On the action items, was there an action to -- for the Committee to submit a letter to NRC with respect to the ICRP 103 Subgroup work? There was not? Okay.

VICE CHAIR THOMADSEN: There was no action on that.

CHAIR MALMUD: You're correct. The Vice Chairman is correct.

MS. COCKERHAM: Okay. That takes care of

1 travel. The next thing is your time, which is what
2 Dr. Eggli was referring to. And time -- this is the
3 end of the pay period. Correct? This week?
4 MR. EINBERG: Yes.
5 MS. COCKERHAM: Yes, this is the second
6 week, so your time will be due to Shayla. You could
7 email it to her Wednesday or Thursday, that would be
8 appreciated. We are going to try a new system. We
9 need to include other secretaries on the emails, and
10 the way the form is set up right now, when you hit
11 send email, it just sends it directly to Shayla. And
12 if Shayla is not there, it needs to go to her backups.
13 And there's no way to get it to her backups, unless
14 you send it to her backup. So, I created a new email
15 for Shayla to send to you that says to send all of
16 your time to her, and to two other secretaries. And
17 your hours can just be a text email of here's the
18 date, so 10/19/2009, eight hours ACMUI meeting;
19 10/20/2009, eight hours ACMUI meeting. And that email
20 goes to all three secretaries, and that's it for email
21 space. So, as soon as they receive that email, they
22 can immediately input your time into the system, and
23 we won't have any late time.
24 Then you still need to fill out the form.
25 And you can either type in the form. It's still

1 typable, and savable, or you can handwrite it and mail
2 that form to Shayla, as you've always done.
3 MR. LEWIS: Please bear with us as we try
4 to make the process better. I know time and
5 attendance is -- it eats away at me, as well. But the
6 Agency is a fee-recoverable Agency, so the timing of
7 all of the staff getting their time in directly
8 effects the bills that are sent to licensees, and the
9 corporate support offices, necessarily, have very
10 tight schedules, and strict systems. And we're trying
11 to work with them, particularly, the Committee and the
12 Medical Consultants, because it's always been a hard
13 process.
14 MS. COCKERHAM: So, I think this will,
15 hopefully, be the easiest way. It's a simple text
16 email to three people. Okay?
17 And the last thing I have, if you'll turn
18 to Tab 18 in your binders, we need to choose a new
19 meeting date. We've had a chance to look at the
20 calendars. There are eight dates that I've already
21 circled in April and May, and those are the dates that
22 the auditorium is available. And I've already
23 reserved the auditorium, so we cannot be bumped,
24 moved, or shifted in any way, shape, or form. So, if
25 we could pick from these dates, are there any dates,

in particular, that don't work for anyone?

MR. LEWIS: Could I make a comment, too, that Ashley doesn't know about yet?

MS. COCKERHAM: That the ACRS room will be ready?

MR. LEWIS: Well, no, that -- I just heard this yesterday, but one of the things that the Commission is considering for the next ACMUI meeting is to conduct it concurrent to the FSME Program Office briefing. So, once a year, FSME goes and tells the Commission about all the stuff that we've done for the year, and some Commissioners would like the ACMUI meeting to be a second panel on that meeting, so that we all hear everything. And that will be a Commission decision, so it's outside of our control.

The current plan for the FSME briefing is in June, so we can pick a date here for a tentative, but if that plan comes to fruition, we're going to have to re-engage you about the spring meeting.

MS. COCKERHAM: I have a question. Will we consider what we did last time, where we flew the members who were giving presentations back -

MR. LEWIS: That would be an alternative.

MS. COCKERHAM: Okay.

MR. LEWIS: Yes, that would be an

alternative.

MS. COCKERHAM: Okay. So, the preference would be for the full ACMUI meeting to coincide with the Commission briefing, if the Commission chooses for ACMUI to participate in that. The other option would be what we did last time, when the two meetings didn't coincide. We flew back the members who were giving presentations to the Commission separately in June, even though we had our full ACMUI meeting in May.

CHAIR MALMUD: I noticed, Ashley, that the fourth is Easter Sunday. That would mean that if the meeting were on Monday and Tuesday, that some people's holiday would be interrupted by their having to travel on Sunday. So, should we consider as a first choice the 8th and 9th?

MS. COCKERHAM: Sure, or we can look at dates, either one.

CHAIR MALMUD: Jim.

MEMBER WELSH: The American Radium Society meeting is May 2nd through 5th, and I, for one, was planning to attend that. So, I don't know if anybody else was, but that's not my first choice.

CHAIR MALMUD: Radium-223?

MS. COCKERHAM: So, Dr. Welsh, would even the 8th and 9th be pushing it for you for travel,

1 getting from one meeting -

2 mEMBER WELSH: I was talking about May.

3 MS. COCKERHAM: That's in May.

4 DR. HOWE: So, he's eliminating May 3rd

5 and 4th.

6 MS. COCKERHAM: Okay. So, it looks like

7 either April 8th and 9th, or May 24th and 25th. Is

8 there a preference for one over the other, April

9 first, or May first?

10 CHAIR MALMUD: Does anyone have a

11 preference?

12 MEMBER GILLEY: I like May 24th and 25th,

13 but I -

14 MS. COCKERHAM: Okay.

15 CHAIR MALMUD: You like the 24th -

16 MEMBER GILLEY: I like to travel on

17 Sunday.

18 CHAIR MALMUD: All right.

19 MEMBER GILLEY: It keeps me out of the

20 office just two days.

21 (Off the record comments.)

22 CHAIR MALMUD: Debbie expressed a

23 preference for traveling on Sunday, rather than during

24 the week. That would make it May 24th and 25th. Is

25 that acceptable to everyone else? It is a conflict

for anyone? Excuse me? I hear a voice behind me.

(Off the record comments.)

CHAIR MALMUD: A member of the public indicates that the American College of Medical Physics will have a conflicting meeting with the 24th and 25th of May.

MS. COCKERHAM: Is anyone planning on attending that meeting?

CHAIR MALMUD: There is no indication that a member of the Committee will have a conflict.

MS. COCKERHAM: Okay. So, we'll write down May 24th and 25th as the first preference?

CHAIR MALMUD: Yes.

MS. COCKERHAM: With April 8th and 9th as the second.

CHAIR MALMUD: April -- yes.

MS. COCKERHAM: And all of that will pend the Commission's decision.

CHAIR MALMUD: We understand that that's tentative, pending the Commission's decision, yes.

MS. COCKERHAM: Okay.

MEMBER SULEIMAN: Now, in June the SNM meets, and that may take a number of people away from here.

CHAIR MALMUD: Yes.

1 MEMBER SULEIMAN: I forget when that is.

2 CHAIR MALMUD: I've forgotten which days

3 it is.

4 (Off the record comments.)

5 CHAIR MALMUD: Mickey, do you know what

6 days the SNM meets in June?

7 DR. GUIBERTEAU: Yes. The Committee

8 meetings start on the third Thursday, the 3rd, and

9 will go to Wednesday, the 9th.

10 CHAIR MALMUD: So, that's a concern for

11 us.

12 MS. COCKERHAM: And I know normally when I

13 make these calendars, I go look at CRCPD, OAS, SNM,

14 ASTRO, ACR, you name it, so that's why there are only

15 eight dates. And I tried to avoid holidays, but I

16 missed Easter on there, so that's Sunday travel.

17 CHAIR MALMUD: Very good. Thank you.

18 MS. COCKERHAM: I will keep that in mind

19 for the Commission.

20 DR. GUIBERTEAU: The 24th and 25th of May

21 are the ABR examinations, if anyone is planning to

22 examine there.

23 VICE CHAIR THOMADSEN: What was that?

24 CHAIR MALMUD: Dr. Guiberteau said -

25 DR. GUIBERTEAU: May 24th and 25th are the

1 ABR examinations for radiation oncology, and
2 diagnostic radiology, if anyone -
3 VICE CHAIR THOMADSEN: I have an exam for
4 the physics, which is the same time.
5 CHAIR MALMUD: So, the preferences are as
6 stated?
7 MS. COCKERHAM: Does that change the
8 preferences for you, or Dr. Thomadsen?
9 DR. GUIBERTEAU: Well, I'm a trustee, so I
10 will be examining, but I could probably get away for
11 the two days, since it's a large group examining. And
12 I make up the schedule, so -
13 VICE CHAIR THOMADSEN: If I'm examining, I
14 can't get away. They don't allow a break in -
15 MS. COCKERHAM: So, should we change the
16 preferences to be April 8th and 9th as the first
17 preference then?
18 CHAIR MALMUD: Is the Committee,
19 therefore, in favor of April 8th and 9th? All right.
20 April 8th and 9th, that's a Thursday and Friday. First
21 choice.
22 MS. COCKERHAM: Okay. That's all I have.
23 Thank you everyone for coming.
24 CHAIR MALMUD: Thank you. And thank all
25 the members of the Committee. Appreciate your time.

1 Wish you a safe trip back home. There are some
2 members of the Committee who will remain for their
3 random drug testing.
4 MR. EINBERG: For those members that were
5 selected, if we could -- Ashley, did you have any
6 thoughts on that, the drug testing is at 1:00. We
7 could meet, perhaps, at a few minutes beforehand in
8 the lobby of Two White Flint, and we could all go up
9 as a group.
10 CHAIR MALMUD: Is there a shuttle?
11 MR. LEWIS: The shuttle is at 12:10, I
12 believe.
13 CHAIR MALMUD: Is there a shuttle from
14 here to White Flint?
15 MR. LEWIS: There is a shuttle to White
16 Flint. It's the shuttle that has been out here every
17 40 minutes, or so. But the shuttle takes a break for
18 lunch, and none of us are familiar enough to know.
19 MS. COCKERHAM: Yes. We can check the
20 shuttle schedule. It's right here on the board.
21 MR. LEWIS: The next one is 12:10.
22 CHAIR MALMUD: 12:30?
23 MR. LEWIS: 12:10 to 12:30.
24 CHAIR MALMUD: Right. I'll take the 12:30
25 shuttle. It stops right in front here?

1 MS. COCKERHAM: Yes.

2 MR. LEWIS: Yes, right there.

3 MS. COCKERHAM: So, we can take the 12:30

4 shuttle, and meet in the Two White Flint lobby.

5 CHAIR MALMUD: I have some bags to take

6 with me.

7 MR. LEWIS: It's a white shuttle, and just

8 ask the person if they're going to White Flint,

9 because there's another NRC building they might go to

10 first.

11 CHAIR MALMUD: Thank you.

12 (Whereupon, the proceedings went off the

13 record at 11:38 a.m.)

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