

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

May 01, 2002

NRC INFORMATION NOTICE 2002-16: INTRAVASCULAR BRACHYTHERAPY
MISADMINISTRATIONS

Addressees:

All Medical Licensees.

Purpose :

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to alert addressees to three reported misadministrations that have occurred at two different facilities during the conduct of intravascular brachytherapy (IVB) procedures, because of improper dose calculation parameters being used. It is expected that recipients will review this information for applicability to their licensed activities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this IN are not new NRC requirements; therefore, no specific action nor written response is required.

Description of Circumstances:

NRC has received three misadministration reports involving overexposures caused by using improper dose calculation parameters. A brief summary of one of the three reported misadministrations, representative of them all, is provided below.

The patient's coronary artery was treated with the IVB device. The intended dose was 8 gray (Gy) (800 rads). During a review of dosimetry and physician records, the licensee discovered that the diameter of the artery was used in the dose calculation, instead of the required radius of the artery. The licensee estimated that the dose to the outer portion of the patient's coronary artery was 14.6 Gy (1,460 rads) rather than the intended 8 Gy (800 rads).

For each of the other two misadministrations, a similar error resulted in estimated delivered doses of 12.5 Gy (1,250 rads) and 14.3 Gy (1,430 rads) for intended doses of 8 Gy (800 rads).

Discussion:

In two of the three cases, the authorized user provided the diameter of the artery, instead of the radius, to the medical physicist, as input for the dwell time (dose) calculation. In the third case, one type of IVB device was employed to calculate the dose, but another type of IVB device was used for treatment of the patient. The IVB device employed for calculating the dose requires

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the diameter of the artery as input in the dosimetry calculations, whereas the IVB device used for treatment of the patient requires the radius of the artery as input. The authorized user provided the wrong dimension (diameter instead of radius) as input to the treatment device, which led to delivery of a dose greater than intended.

Licensees are encouraged to consider whether the potential for misadministrations resulting from improper dose calculation parameters being used for IVB procedures exists at their facilities. If the potential does exist, one suggestion for reducing it would be to verify and clearly indicate, on forms used in treatment planning and/or written directives, whether the radius or the diameter of the artery to be treated should be used for the dwell time (dose) determination. Additionally, licensees should consider this issue in their procedures for verifying that the treatment to be delivered is what was intended.

This IN requires no specific action nor written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate regional office.

/RA/

Donald A. Cool, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Attachments:

1. List of Recently Issued NMSS Information Notices
2. List of Recently Issued NRC Information Notices

Technical Contact: Ronald E. Zelac, NMSS
(301) 415-7635
E-mail: rez@nrc.gov