



BRIGHAM
AND
WOMEN'S
HOSPITAL



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PROPOSED RULE **PR 20**

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May 20, 1994

The Secretary of the Commission
U.S. Nuclear Regulatory Commission
Docketing and Service Branch
Washington, D.C. 20555

Re: Proposed rule making RE:
Disposal of Radioactive Material
into Sanitary Sewage Systems

To Whom It May Concern:

My position at the Brigham and Women's Hospital, a large NRC Broad Licensed medical/research facility, is that of Radiation Safety Officer. The thought of losing the option for disposing of allowed concentrations of radionuclides into the sanitary sewage disposal is most disturbing. I believe sewage disposal of water soluble radioactive material is ALARA, especially when it pertains to radiocontaminated patient excreta. The administration of I-131 as sodium iodide to individuals with metastatic thyroid cancer is a common treatment. A typical patient receives 100 mCi's of this radionuclide and approximately 50% of this dose is excreted in the urine within 18 hours. Presently the patient is allowed to excrete into the toilet when needed. If collection of this excreta was required serious exposure potential would exist on the health care unit. The gamma-factor for I-131 is 2.2R/hr/mCi at 1 cm. Fifty mCi's of I-131 contained within a collection urinal would conservatively read 220 R/hr/50 mCi's at 1 cm, 236.8 mR/hr at 30.48 cm, and 22 mR/hr at 100 cm. This exposure is totally unnecessary when sewage disposal exists. The total water usage for the Brigham and Women's Hospital is 390,924.3 gallons per day, or 1,479,648,475.5 mls during this time period. For a 100 mCi patient where 90% of the I-131 administered is excreted into the sewage system during a 24 hour period with no decay correction, the average concentration of I-131 leaving the complex is 0.00006 microCi per ml of sewage water. This translates to 0.049 microCi per ml of storage water per minute, assuming 50 mCi is excreted at one time, which is highly unlikely.

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In diagnostic nuclear medicine at our institution an average of 9 bone scans are performed daily at 25 mCi per study. Assuming 50% of the administered dose is excreted with the urine, then 112.5 mCi per day finds its way into the sanitary sewage system. This translates into 0.000076 microCi per ml sewage/day when not correcting for decay. If collection of this urine was required, universal precautions, lack of adequate space and unnecessary radiation exposure would present an unhealthy atmosphere for nuclear medicine personnel.

Research disposal via approved sinks is based on 10CFR20, Appendix C values. This approach resulted in a total of 188,741.38 microCi in 1993. On a per month basis, assuming a uniform disposal logistic, the radioactivity concentration disposed equals 0.000000354 microCi/ml sewage.

It is quite apparent from the above discussion that the present sanitary sewage disposal release of radioactive material is environmentally adequate. Without the present regulatory allowances unnecessary exposure to radioactivity as well as to viral/bacterial contamination would result. In addition, the necessity to construct "shielded store rooms" on the clinical care unit and within Nuclear Medicine would result in increased health care costs.

Sincerely,



Frank P. Castronovo, Jr., PhD
Director, Health Physics & Radiopharmacology

FPC/rac

cc: NRC File
B. Leonard Holman, M.D.
J. Gaida