

AbstractID: 2638 Title: Releasing Nuclear Medicine Patients to the Public: Dose Computations and Discharge Instructions

Thousands of patients are treated annually in the United States with iodine-131 for various medical conditions. Prior to 1996, patients treated with more than 30 millicuries of iodine-131 were required to be hospitalized in a private room until their iodine-131 body burden decreased to less than 30 millicuries. In 1996, the United States Nuclear Regulatory Commission (NRC) introduced a revision to 10 CFR 35.75 that permitted release based upon the anticipated dose to members of the public, rather than upon patient body burden. Consequentially, many treatments that formerly required hospitalization may be performed as outpatient treatments, and required hospitalizations can be significantly shortened. These regulations have been adopted by the Agreement States, and "early release" of in-patients and treatment as outpatients is becoming more widespread. Medical physicists who work in hospital settings can expect to participate in "early release" and outpatient radioiodine therapeutic procedures. Medical conditions that are treated with iodine-131 include hyperthyroidism, thyroid cancer, neuroendocrine tumors and non-Hodgkin lymphoma. Candidacy for outpatient treatment depends in part upon whether patients are continent of urine and capable of self-care. The revised NRC regulations permit conservative public dose computations that account for tissue shielding, biological elimination, physical decay and occupancy factor, which is an index of the amount of time members of the public could spend in close proximity to the released patient. Computations must demonstrate that radiation dose to members of the public will not exceed 500 millirem (5.0 mSv) if the patient is to be released. If the patient is released based upon such computations, a record of the release must be created and retained by the licensee for three years. The record must document the anticipated dose to a member of the public and the method by which the anticipated dose was calculated. In addition, detailed written instructions regarding how the patient can maintain the radiation dose to family members other members of the public as low as reasonably achievable (ALARA). The implementation of "early release" has apparently been successful from an ALARA standpoint. Measurements of actual external radiation exposure to family members of released iodine-131 patients demonstrate cumulative doses that are a small fraction of the anticipated dose computed using conservative assumptions.

Educational objectives:

1. Introduce participants to the medical conditions that are treated with radioiodine.
2. Review the regulatory considerations under 10 CFR 35.75 and 10 CFR 20 regarding both inpatient and outpatient radioiodine procedures.
3. Review ways in which the regulatory requirements may be satisfied, including dose-rate measurement, "public" radiation dose computations, post-discharge instructions, and addressing the concerns of patients and their families. Web-based methods to facilitate documentation of outpatient treatment will be introduced.