Radioprotection Using Iodine-131 for Thyroid Cancer and Hyperthyroidism: A Review

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Radioiodine (iodine-131, or I-131) therapy has been used successfully for thyroid therapy for more than 50 years. Protocols for treatment with I-131 differ from country to country and even from hospital to hospital in the same country. Daily area surveys of hallways, stairwells, and rooms adjacent to isolation rooms must be conducted and documented to ensure that doses to any individuals in unrestricted areas do not exceed 20 mcSv (2 mrem) in one hour. Nursing and housekeeping staffs must realize that once therapy has begun, no items are to be removed from the room unless first cleared by nuclear medicine or radiation safety personnel. With proper education and instructions for patients and their family members, radiation exposure to healthcare professionals and the general public can be minimized. The objectives of this article are to review (a) practical radiation safety concerns associated with hospitalized patients receiving I-131 therapy, (b) preventive measures to minimize potential exposure and contamination problems, and (c) radiation safety precautions and preventive measures to minimize radiation exposure to family members and helpers living with patients receiving outpatient I-131 therapy.

At a Glance

- Practical radiation safety concerns are associated with hospitalized patients receiving radioiodine therapy.
- Preventive measures can be taken to minimize potential exposure and contamination problems.
- Nurses should learn radiation safety precautions and preventive measures to minimize radiation exposure to family members and helpers living with outpatients receiving radioiodine therapy and the general public.

The first report of radioiodine therapy for metastatic thyroid carcinoma was in 1945 (Seilini & Marinelli). The efficacy of radioiodine therapy is directly related to tumor uptake and retention. Effective tumor uptake is achieved with a concentration of 0.5% of the dose per gram of tumor tissue with an effective...