

## Gallagher, Carol

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**Subject:** FW: (NRC-2015-0020)  
**Attachments:** TITLE PAGE.docx; sole.fig.tif; Figure legend.docx; Comment NRC.docx

**From:** Agrawal, Nidhi [mailto:Nidhi.Agrawal@nyumc.org]  
**Sent:** Saturday, March 12, 2016 3:29 PM  
**To:** Gallagher, Carol <Carol.Gallagher@nrc.gov>  
**Subject:** [External\_Sender] (NRC-2015-0020)

Dear Ms. Gallagher,

Hope you are doing well. I would like to submit the attached draft as a comment for radiation safety.

I have attached a striking image of one of the patients but not sure if those can be submitted as well.

Thanks for your help,

Nidhi Agrawal  
Endocrinology Fellow  
NYU School of Medicine

11/16/2015

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## **TITLE PAGE**

### **TITLE:**

"Evidence From Radiation Safety Screening Supports The Need For Physicians To Employ Optimal Medical Knowledge & Patient-Specific Judgment Before Using I-131 To Ablate Thyroid Remnants or Treat Thyroid Cancer"

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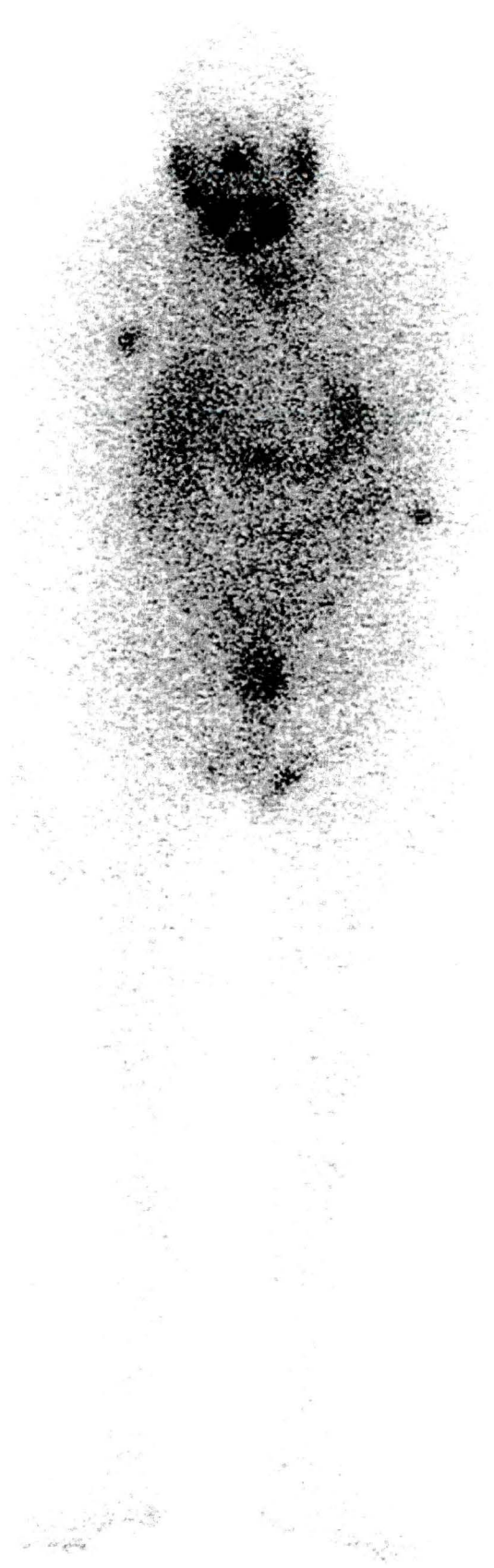
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Anterior



B



**Figure legend:**

**I-131 Whole Body Scan (WBS) at (A) 7 and (B) 13 days post therapy**

Figure A shows foci of intense uptake at the base of the neck and upper chest along the midline, faint uptake in the right axilla, diffuse bowel activity, physiologic activity in the salivary glands and intense uptake in the groin and soles. Figure B shows persistent uptake in the soles representing urinary contamination.



## **Evidence from Radiation Safety Screening Supports**

### **The Need For Physicians To Employ Optimal Medical Knowledge & Patient-Specific Judgment Before Using I-131 To Ablate Thyroid Remnants or Treat Thyroid Cancer**

The widespread use of radioactive Iodine (I-131) for adjuvant or ablative therapy of thyroid cancer, a disorder that is associated with a small likelihood of spread, disfigurement, or decreased lifespan (1,2) carries a significant potential to contaminate caregivers, relatives, medical facilities, and the wider environment. The risks are greatest and avoidable in patients with multiple medical comorbidities, physical dependence, chronic debility or behavioral dysfunction and are largely due to poorly controlled urine, saliva and gastrointestinal fluids. Thus, therapy with I-131 may be ill-advisable in this cohort of patients. Judging from several of our recent experiences exemplified by two patients, this issue has not been given as much attention as it deserves.

A 75 year old male with kidney disease, urinary incontinence and physical dependence was treated with I-131 after meticulous radiation dosimetry and was hospitalized for 5 days under strict isolation precautions. He was discharged home after careful instructions to him and a professional aide. Post-treatment Whole Body Scan (WBS) on days 7 and 13 showed intense I-131 uptake at the base of the neck and the right axilla along with significant uptake in the groin (diaper) and soles of the feet compatible with urinary contamination (figure). There was obvious contamination of his floors.

A 74 y/o female with a recent cerebrovascular accident requiring percutaneous endoscopic gastrostomy was treated with I-131 therapy for metastatic thyroid cancer. She received liquid I-131 via G-tube as an inpatient under strict radiation precautions followed by water flushes under supervision of the staff. Strict instructions were given to avoid contamination including keeping the G-tube on an absorbent pad, wearing gowns, gloves and mask when changing and clamping the G-tube so as to keep reflux to an absolute minimum. Mechanical malfunction of the PEG tube resulted in accidental spillage and contamination of the bedsheets. A nurse was contaminated on the skin with a small amount of gastric secretions. Nurses underwent thyroid uptake measurements at the time of each event and were found to have no evidence of internal contamination. They were advised on the benefits and risks of immediate iodide prophylaxis and declined.

Patient-specific iodine bio-kinetics, medical co-morbidities and social dependence are extremely important in understanding the safe dosing of I-131 (3, 4). The burden of radioactive iodine and level of contamination are largely related to the behavior of the individual and associated medical problems. Renal insufficiency, urinary incontinence and diaper dependence are important considerations in patients considered for treatment. In patients with artificial feeding tubes, special attention and adequate spillage protection are imperative to maintain radiation safety precautions.

Given our recent experience we strongly suggest considering the individuality of the patient and potential risk of exceeding radiation safety limits before treatment with I-131.

Understanding and complying with strict radiation precautions can help physicians and patients maintain radiation safety after therapy. We conclude that in some cases treatment with I-131 is best avoided because the likelihood of benefit to the patient is small and untoward consequences when viewed in a wide perspective may not be insignificant.

#### References:

1. Morris LG, Sikora AG, Tosteson TD, Davies L. The increasing incidence of thyroid cancer: the influence of access to care. *Thyroid*. 2013 Jul;23(7):885-91. doi: 10.1089/thy.2013.0045. Epub 2013 Apr 18. PubMed PMID: 23517343; PubMed Central PMCID: PMC3704124.
2. Hoang JK, Nguyen XV, Davies L. Overdiagnosis of thyroid cancer: answers to five key questions. *Acad Radiol*. 2015; 22:1024-1029.
3. Ozcan Kara P, Gunay EC, Erdogan A. Radioiodine Contamination Artifacts and Unusual Patterns of Accumulation in Whole-body I-131 Imaging: A Case Series. *Int J Endocrinol Metab*. 2014 Jan 1;12(1):e9329. doi: 10.5812/ijem.9329. eCollection 2014 Jan. PubMed PMID: 24696698; PubMed Central PMCID: PMC3968977.

4. Blum, M., Chandra R., Marshall, C.H.: Environmental Contamination with I-131 Related to the Treatment of Hyperthyroidism and Carcinoma of the Thyroid. IEEE: Transaction on Nuclear Science, NS18, 57-59, February 1971.