

Summary of Assessment of Where Patients Reside Immediately Following Their Release Report

Introduction

As described in the “Summary of Patient Release after Radioiodine Therapy Research Review,” the literature review conducted by the U.S. Nuclear Regulatory Commission (NRC) staff did not result in the identification of studies that analyzed the doses to members of the public that are unknown to the patient, such as nursing home staff/residents and hotel workers. Therefore, the NRC staff decided to conduct a pilot study to evaluate the extent to which patients treated with Iodine-131 (I-131) for hyperthyroidism or thyroid cancer go to locations other than their homes immediately following treatment. This enclosure provides the methodology and results of the draft pilot study.

Methodology

This study involved a questionnaire that requested information from a limited number of licensees about patient behavior following I-131 treatment. The questionnaire requested information regarding the annual number of patients treated with I-131 by each licensee over the past 2 years, what number of these patients were hospitalized, and how many patients went to locations other than their homes. The questionnaire also asked the licensees to provide information regarding their treatment protocol and treatment facility.

The questionnaire was sent to nine non-Federal licensees. Table 1 provides characteristics of the licensees that were sent questionnaires. The licensees to whom the survey was sent were selected to provide results from a range of sizes of facilities and from different regions in the country. The assigned regions for those facilities were based on United States Census Bureau divisions.

Table 1. Pilot Study Non-Federal Treatment Facilities

Region	Number of Beds
East North Central	> 1,400 main campus 4,450 system-wide
Mid-Atlantic 1	1,100
West South Central	636
New England	1,150
Mountain	268
Mid-Atlantic 2	400
West North Central	794
Pacific	411
East South Central	836

The questionnaire was also sent to Federal licensees that deliver I-131 treatment, including the Veterans Administration (VA), military services (i.e., Navy and Air Force), and the National Institutes of Health. In addition, the NRC staff requested information from the Federal Bureau of Prisons (BOP), even though the staff presumed that most inmates return to their correctional institutions following treatment, in order to determine where the inmates are treated and what protocols are applied to minimize radiation exposure to others (e.g., institutional personnel and other inmates).

Results

Non-Federal Facilities

Nine non-Federal licensees responded to the questionnaire. Tables 1 and 2 summarize the results. Table 1 provides a comparison of the patients that were released after treatment to the patients that were not released and hospitalized. As reflected in Table 1, most of the licensees had a small percentage of treated patients who were hospitalized— approximately 8 percent of patients were hospitalized following thyroid cancer treatments and 0.4 percent following hyperthyroid treatments. One licensee stated that it hospitalized approximately 60 percent of thyroid cancer patients. Table 2 provides a summary of patients that were treated and released to locations other than their homes (nursing homes, assisted living facilities, prisons, or hotels). As Table 2 indicates, one of the licensees sent a substantial number of treated patients to locations other than their homes. It should be noted that several of the questionnaire responders indicated that not all patients inform licensees where they intend to go after treatment or the distance they travel to and from treatment facilities.

Table 1. Pilot Study Non-Federal Facilities Survey Summary

Region	Patients Treated with I-131 per Year:		Patients Hospitalized for Treatment per Year:	
	Thyroid Cancer	Hyper-thyroidism	Thyroid Cancer	Hyper-thyroidism
East North Central	137	59	17	0
Mid-Atlantic 1	60	60	2	1
West South Central	53	22	20	0
New England	338	112	4	0
Mountain	46	16	1	0
Mid-Atlantic 2	25	25	15	0
West North Central	80	160	8	0
Pacific	23	13	3	1
East South Central	133	69	2	0

Table 2. Pilot Study Non-Federal Facilities Survey Summary

Region	Number of Patients Returning to locations per year:			
	Nursing Home	Assisted Living	Prison	Hotel
East North Central	0	0	0	0
Mid-Atlantic 1	1	0	0	0
West South Central	0	0	0	0
New England	0	2	0	0
Mountain	0	0	0	2
Mid-Atlantic 2	0	0	0	0
West North Central	Not known	Not known	Not known	Yes
Pacific	0	0	0	0
East South Central	3	3	6	33

Federal Facilities

Approximately 110 VA medical facilities provide radionuclide therapy and administer I-131 for thyroid disease. Nineteen VA medical facilities responded to the questionnaire. The summary of the VA responses to the questionnaire are provided in Tables 3 and 4. As shown in Table 3, the VA medical facilities responded that an average of approximately 23 percent of patients were hospitalized following thyroid cancer treatments and 0.3 percent following hyperthyroid treatments. As shown in Table 4, the VA medical facilities responded that they sent a very small number of treated patients to locations other than their homes.

Table 3. Pilot Study Veterans Administration Survey Summary

Region	Patients Treated With I-131 per Year:		Patients Hospitalized for Treatment per Year:	
	Thyroid Cancer	Hyper-thyroidism	Thyroid Cancer	Hyper-thyroidism
East South Central	3	5	2	0
West South Central 1	0	3	0	0
West South Central 2	10	20	1	0
Pacific 1	4	17	1	1
Pacific 2	3	1	3	0
South Atlantic 1	24	3	0	0
South Atlantic 2	5	3	5	3
West South Central	5	10	0	0
New England	5	5	2	0
West North Central 1	10	8	1	1
West North Central 2	15	9	1	0
South Atlantic	3	4	0	0
Mid-Atlantic	3	8	0	0
East North Central 1	7	7	1	0
East North Central 2	6	15	1	1
Mid-Atlantic	8	10	0	0
West South Central	< 6	< 20	1	0
Pacific 1	5	4	2	0
Pacific 2	13	30	10	0

Table 4. Pilot Study Veterans Administration Survey Summary

Region	Number of Patients Returning to:			
	Nursing Home	Assisted Living	Prison	Hotel
East South Central	0	0	0	0
West South Central 1	0	0	0	0
West South Central 2	0	0	0	0
Pacific 1	0	0	0	0
Pacific 2	0	0	0	0
South Atlantic 1	0	0	0	0
South Atlantic 2	0	0	0	0
West South Central	0	0	0	0
New England	0	0	0	0
West North Central 1	0	0	0	0
West North Central 2	1	0	0	0
South Atlantic	0	0	0	0
Mid-Atlantic	0	0	0	0
East North Central 1	0	0	0	0
East North Central 2	0	0	0	0
Mid-Atlantic	0	1	0	0
West South Central	0	0	0	0
Pacific 1	0	0	0	0
Pacific 2	0	0	0	2

The military services maintain 51 medical facilities, which include both hospitals and clinics, of which 22 provide I-131 treatments. Seven facilities responded to the questionnaire; however, the Navy combined its responses for 3 of its medical facilities. The collected data is summarized in Tables 5 and 6.

Table 5. Pilot Study Military Survey Summary

Location	Patients Treated with I-131 per Year:		Patients Hospitalized for Treatment per Year:	
	Thyroid Cancer	Hyper-thyroidism	Thyroid Cancer	Hyper-thyroidism
<u>Air Force</u>				
Base 1	7	6	1	0
Base 2	3	4	0	0
Base 3	0	0	0	0
Base 4	10	5	1	0
<u>Navy</u>				
Combined	85	80	31	10

Table 6. Pilot Study Military Survey Summary

Location	Number of Patients Returning				Other Camp
	Nursing Home	Assisted Living	Prison	Hotel	
<u>Air Force</u>					
Base 1	0	0	0	0	
Base 2	0	0	0	3	
Base 3	0	0	0	0	
Base 4	0	0	0	0	
<u>Navy</u>					
Combined	0	0	0	2	2

The BOP responded to the NRC, stating it had no specific procedures and standards for handling inmates requiring I-131 treatment. The BOP reported that three individuals were treated in 2014 with I-131 as outpatients at outside civilian medical facilities for thyroid cancer and four were treated for hyperthyroidism.

Conclusions

Although this study has limitations due to the small number of licensees who received questionnaires, it did provide the NRC staff with valuable information. First, this study demonstrates that some licensees knowingly send patients to locations other than their homes. However, none of the licensees surveyed reported that they sent a significant number of patients to a specific location other than the patient's home. Second, this study also showed that the majority of patients are not being hospitalized following I-131 treatment.

Attachment:
Questionnaire

SC&A, Inc., has been tasked under contract to the U.S. Nuclear Regulatory Commission with determining where patients reside immediately following release after I-131 therapy. Of particular interest are locations other than home. Some patients do not return immediately to their homes, but, instead, go to hotels, nursing homes, prisons, assisted living facilities, and other residential settings. SC&A and the NRC believe that the results of the survey will be of interest to the entire nuclear medicine and health physics communities. We are circulating this survey to various hospitals and medical establishments to assist in answering this question. Please fill out the survey and place it into the prepaid envelope or scan and send it via email to sking@psu.edu. Note that all responses will be "de-identified" in any reports released to the public to protect the privacy of the responding institutions. Should you have any questions, please feel free to contact us at 717-531-8765.

For the past two full years:,

1. A. How many thyroid cancer patients do you treat with I-131 per year? _____
 B. How many hyperthyroid patients do you treat with I-131 per year? _____
2. Can you please list which radio-pharmacies your facility uses for these procedures?
3. How many patients do you hospitalize for I-131 therapy treatments (vs. immediate discharge)?
 A. Thyroid cancer _____
 B. Hyperthyroid _____
4. Do you normally administer I-131 at a specific time each day you use it?
 Please circle: morning afternoon both.
5. What criteria do you use to release your I-131 patients? (Be as specific as possible; e.g., 150 mCi, 500 mRem to family, etc.) _____
 A. For outpatients, how long do you keep patients until discharge (hours)? _____
6. How do you counsel thyroid cancer patients that you release *immediately after treatment*?
 Do you instruct patients to:

a. Flush twice	YES/NO
b. Keep a specified distance from others	YES/NO
c. Wash clothes separately	YES/NO
d. Shower several times per day	YES/NO
e. Other (please list)	YES/NO
7. For those patients who do not return to their private residence, how many went to the following;
 (per/by year)

a. Nursing Home	YES/NO/not known	If yes, number _____
b. Assisted Living	YES/NO/not known	If yes, number _____
c. Prison	YES/NO/not known	If yes, number _____
d. Hotel	YES/NO/not known	If yes, number _____
e. Other _____	YES/NO/not known	If yes, number _____
f. Don't know _____		

9. If you have patients who go to a hotel, nursing home, or other facility, do you send your patients to a **specific** facility (hotel, nursing home, prison, etc.) on an on-going basis?
- A. If so, is there specific guidance given to the facility administration or staff, i.e., radiation protection protocol; oversight or follow-up by RSO?

The following information will be de-identified when placed into our report. Our report will only indicate your general size (beds), what broad region your facility is located in (Mid-Atlantic, west, south, east, etc.) and will indicate if your facility is classified urban, suburban, or rural. We will not release any information that might identify your institution uniquely. Please answer as fully as possible.

Facility Demographics:

Hospital _____ or Outpatient Facility/Clinic _____ or Physician Office _____

If Hospital, Number of Beds _____

Location: Urban _____ Suburban _____ Rural _____

Is your facility a tertiary referral center? _____

Distance travelled by patients from their stated place of residence; please fill in number of patients in each category:

- a. < 100 miles
- b. 100 – 250 miles
- c. 250 – 500 miles
- d. 500 – 1000 miles
- e. Internationally

Optional:

Facility Name _____ (Confidential – for statistical use only)

City _____ State _____

If we want to clarify your responses or ask further questions, may we contact you? _____

Radiation Safety Officer/Contact Information _____

Prescribing Physician/Contact Information _____

Nuclear Medicine Technologist or Medical Physicist/Contact Information _____

Additional comments: