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COMPLIANCE INVESTIGATION REPORT FOR
DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D. C. 20012
LICENSE NO. 8-1738-2

INVESTIGATION CONDUCTED MARCH 24 - APRIL 10, 1969

RE: INTERNAL EXPOSURE - TECHNICIAN SUSPECTED OF HAVING WILLFULLY INGESTED AS MUCH AS 10 MILLICURIES OF TECHNETIUM-99m and 25 MICROCURIES OF IODINE-131

The subject report has been reviewed. This is to confirm that we do not plan to correspond with Walter Reed Army Medical Center concerning the investigation as no enforcement action appears appropriate. No items of noncompliance or safety items were noted during the investigation. We consider the case closed.

Original Signed by
T. W. Brockett

T. W. Brockett
Materials Inspection and
Enforcement Branch
Division of Compliance

cc: CO:I
Helen Semmes

Information in this record was deleted in accordance with the Freedom of Information Act, exemptions 6
FOIA- 2006-0238

Portions Ex 6

MAY 2 1969

OFFICE ▶	CO	CO				
SURNAME ▶	TWBrockett:akb	JRRoeder				
DATE ▶	4/29/69					

Form AEC-318 (Rev. 9-53) AECM 0240 U.S. GOVERNMENT PRINTING OFFICE : 1968 O—296-617

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

CO:I

JUN 5 1969

Files

DEPARTMENT OF THE ARMY, WALTER REED ARMY MEDICAL CENTER, WASHINGTON, D. C., LICENSE NO. 8-1738-2

On March 21, 1969, Region I was informed by the subject licensee that a technician had apparently ingested some radioactive material. On March 24, 1969, Region I conducted an investigation. It was concluded that the technician apparently self-administered microcurie quantities of iodine 131 and millicurie quantities of technetium 99. The investigation revealed that the technician has a past history of a self-inflicted wound and of mental instability. There were no items of noncompliance and the case was closed by memo to files dated April 30, 1969.

As a result of an investigation conducted by Walter Reed Hospital, the hospital also concluded that the technician deliberately ingested the radioactive material. Walter Reed sent in a comprehensive report dated May 12, 1969, of the results of its investigation to the AEC. The report contains a great deal of medical information concerning the technician and alludes to his past behavioral abnormalities. After review of the report, we have decided not to place a copy in the Public Document Room at this time. Although the name of the technician would be deleted, we believe no useful purpose would be served by placing the report in the PDR.

Original signed by:
Jack R. Roeder

Jack R. Roeder, Chief
Materials Inspection &
Enforcement Branch
Division of Compliance

cc: CO:I
DML:IB, w/cpy ltr dtd 5/12/69
w/encl.
Helen Semmes

JUN 9 1969

DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20012

IN REPLY REFER TO
MEDEC-RS

MAY 1 1969

SUBJECT: Report of Overexposure

THRU: The Surgeon General
ATTN: MEDPS-PO
Department of The Army
Washington, D.C. 20315

TO: Director
Division of Licensing and Regulation
U.S. Atomic Energy Commission
Washington, D.C. 20545

1. Forwarded, herewith, incompliance with 10 CFR Part 20.405(a) are six (6) copies of each of the following documents relating to an investigation into the facts surrounding an internal exposure to radioisotopes incurred by a radioisotope technician assigned to Walter Reed General Hospital in March 1969.

a. Report of Investigation, Radioisotope Technician, WRGH (Incl 1)

b. Minutes of a Special Radioisotope Committee Meeting, convened on 14 April 1969 to consider the facts surrounding the subject exposure. (Incl 2)

c. Letter, MEDEC-RS, Subject: Notification of Technical Overexposure, addressed to the subject individual. (Incl 3)

d. Identification Data as required by 10 CFR Part 20.403(c). (Incl 4)

2. Request that all questions and/or comments pertaining to this matter be referred to the Health Physics Officer, Bldg 188, Forest Glen Section, Walter Reed Army Medical Center, Washington, D.C. 20012 (Telephone: IDS Code 198 - 5161 or Commercial Area Code 202 - 576-5161).

FOR THE COMMANDER:

4 Incl
as

R. NYSTROM, Jr.
LTC, MSC
Adjutant

MAY 5 1969

APR 17 1969

REPORT OF INVESTIGATION
RADIOISOTOPE TECHNICIAN
WALTER REED GENERAL HOSPITAL

1. The following report is a summary of the findings of an investigation into the facts and circumstances surrounding the uptake of radioactive material by an enlisted Radioisotope Technician assigned to the Nuclear Medicine Section, Radiology Service, Walter Reed General Hospital during the month of March 1969.

2. Background Information: The individual enlisted in the US Army on 30 Jul 1966 for a three (3) year term and was assigned to WRAMC on 17 Oct 1966 following basic training. Since he had been trained as a radioisotope technician at the University of Michigan Medical Center, Ann Arbor, Michigan prior to enlisting; he was assigned to the Nuclear Medicine Section, WRGH. His performance of duty and technical knowledge were exemplary. On 1 Feb 1969, the individual sustained lacerations of his abdomen and face in the Radioisotope Clinic. Although he initially alleged that the injury resulted from an assault on him as he was attempting to prevent two individuals from stealing a government owned television set; the incident was shown to be a hoax, the laceration proved to be self-induced, and ultimately he admitted the facts and circumstances. No sutures were required but as a result of this incident the individual was hospitalized for psychiatric evaluation from 5-10 Feb 69. There was no evidence of psychosis and the diagnosis was one of a Character-Behavior Disorder. The diagnosis made by the psychiatrist who evaluated him was:

"Situational Maladjustment, acute, moderate, manifested by suicidal gesture. Stress: Routine Military Duty. Predispositon: Moderate Schizoid Personality Traits. Impairment for further military service. None."

Since 17 Feb 69 he has been followed as an outpatient in Group Therapy. According to his psychiatrist, there is no evidence of a thinking disorder, but he does live out a glorious fantasy.

3. Summary of Current Incident:

a. On Sunday, 16 March 1969, at about 1000-1030 hours, the individual performed a brain scan using Technetium-99m on a semi-comatose patient. The individual claims that during the injection the patient moved in such a way that his (the subject technician) left hand was scratched and punctured by the hypodermic needle. According to the technician 0.2-0.4 ml (0.94-1.88 mCi) of Technetium-99m were injected into his hand and that his hand bled a few drops after the needle was withdrawn. He returned to the laboratory a few feet away, washed his hands thoroughly, applied a band aid, changed the needle, and returned to complete the procedure. CPT Robert W. Fortner, MC, witnessed the injection of the radioactive material and states that the injection was made without incident and that the above sequence of events did not take place.

b. According to the technician, he handled 50 uCi of Iodine-131 in a 2.5 ml syringe - 1-1/2 inch needle combination on Saturday, 15 Mar 69 and Sunday, 16 March 1969 which he used for instrument calibration. He states that the material was withdrawn from a stock solution prepared for diagnostic administration the following week and returned to the stock solution following use. The procedure was conducted in the radiological fume hood which was apparently operating normally at the time. Surveys of the air flow show no significant changes from 28 June 1967 to 21 March 1969. A power outage was scheduled for 15 March 1969 and certain of the sensitive nuclear counting equipment was turned off on Friday, 14 March 69 to prevent damage in the event of a power surge. The technician states that the hood was off but the lights were on when he was working with the isotopes. However, LTC Gerald S. Johnston, MC, Chief, Nuclear Medicine Section, WRGH, is confident that the hood was left running. Since the lights had to be on for there to have been enough light in the room to work, it must be assumed that the hood was operating. The technician also states that the window of the hood was fully open, but that he never inserted his head (breathing zone) into the hood. Although this cannot be refuted, the laboratory has an exceptional record for keeping the window in the proper position to block the breathing zone of the workers. Such a window position is inconsistent with day-to-day observation in this laboratory. The technician also states that to the best of his knowledge no accident occurred during the handling of these isotopes. This is corroborated by the findings of the radiological protection survey conducted on 21 March 1969.

c. On Monday, 17 March 69, the technician showed a band aid covering a small scratch on his left hand to other technicians and stated that he had been injured during the brain scan on Sunday (See para 3a, above). About 1430 hours, an On-the-Job Trainee Radioisotope Technician who was being trained by the subject individual, assisted him in the use of the 2x2 Sodium Iodide scintillation thyroid probe to evaluate himself. Although the record of these findings has disappeared, it is generally agreed that the highest count rate was in the region of the bladder, the next highest in the region of the thyroid, and a count rate significantly higher than background all over the viscera. In the absence of actual data, no calculations can be made; however, this would be consistent with an uptake of Iodine-131 and/or Technetium-99m no earlier than Sunday, 16 Mar 69 and later than the morning of Monday, 17 Mar 69. The individual discussed the findings with LTC Johnston who sent him to the Whole Body Counter. If the uptake had occurred as alleged by the individual the quantity injected (0.94-1.88 mCi) would have resulted in an uptake in the thyroid of 282-564 uCi (assuming a normal thyroid) which would have decayed by physical half-life to 8.8-17.6 mCi by the time of the discussion. The individual did not report to the Whole Body Counter.

d. On Tuesday, 18 March 1969, the individual went into the laboratory at the Radioisotope Clinic and, in the presence of a group of technicians, surveyed himself with a portable survey instrument (Eberline Model E-120 with HP210 Probe). He obtained a reading over his sternum which he said was 10 mR/hour. SP4 Kubecki confirms the meter reading but could not

see the scale setting on the instrument. The ambient gamma background in that location was measured on 24 March 1969 and found to be 1 mR/hour.

e. Also on Tuesday, 18 March 1969, the individual led his assistant, SP4 Kubicki through a scan of his thyroid with the Picker Magnascanner V using a window setting of 314-414 KeV (Iodine-131). The maximum meter reading on the ratemeter of the Magnascanner was 15,000 cpm at some point over the thyroid. The window setting is reasonably certain and, if correct, would confirm the presence of Iodine-131 at that time since Technetium-99m would not give a significant count rate in that window. Following this procedure, evaluations were conducted on the individual's thyroid using the thyroid probe and various settings. The OJT technician performed the evaluation. The records of these procedures have also vanished, however, LTC Johnston believes that approximately 2.5 mCi of Iodine-131 would have had to have been in the thyroid at that time to give the results obtained, assuming the Iodine-131 window was used. LTC Johnston again sent the individual to the Whole Body Counter, but again he did not go.

f. At some time on Tuesday, 18 Mar 69, the individual saw Major Horace B. Gardner, MC who is the responsible officer for the Whole Body Counter and happened to be in the Radioisotope Clinic on another matter. The subject technician commented to the effect that he bet he would light up Dr. Gardner's machine now. Other comments were made which alluded to his body burden, but the incident is meaningful only in retrospect since Dr. Gardner was unaware of the overall situation and therefore attached no significance to the conversation.

g. Late in the afternoon of Wednesday, 19 March 69, CPT Elizabeth Gotshall, MSC, who supervises the technicians in the Radioisotope Clinic, first learned of the Sunday incident and discussed the matter with LTC Johnston. Considering the magnitude of the initial exposure (according to the individual's statements) and the time interval involved, no action was indicated. Approximately 15 half-lives had elapsed and thus only 0.003% of any Technetium-99m absorbed on Sunday, 16 March 1969 would have remained at that time.

h. On Thursday, 20 March 1969, SP6 Troy R. Blanton, WRAMC, Health Physics, was surveying some technicians in the Radioisotope Clinic for contamination. When the subject technician was checked, a generalized reading above background was found and a hot spot of 3 mR/hr (with a portable survey meter, Eberline Model E-120 with HP 190 end window probe) in the upper right abdomen. Under questioning by SP6 Blanton, the technician related the alleged incident on 16 March 1969. SP6 Blanton advised SFC Hugh B O'Neil, his immediate supervisor, of the incident about noon. SFC O'Neil planned a follow-up visit to the Radioisotope Clinic for later in the day but did not immediatey respond because of (1) the time which had elapsed since the incident and (2) previous experience with similar injuries.

i. At about 1300 hours, Thursday, 20 March 1969 CPT Elizabeth Gotshall, MSC performed several evaluations on the subject technician.

(1) Using Picker Dynapix, a kidney scan using settings for Technetium-99m and Mercury. The scan was negative; i.e. no scan was obtained and thus it may be concluded that no significant quantities of these isotopes were located in the lower abdomen at that time.

(2) Using the thyroid probe, the following data was obtained:

Window	Counts/Minute	Location
60-140 KeV (Tc-99m)	25,602	Anterior upper Rt. Quadrant
	12,102	Posterior upper Lt. Quadrant
	32,965	Posterior upper Rt. Quadrant
	4,442	Thyroid
314-414 KeV (Iodine-131)	6,689	Thyroid

The following statements can be made with respect to the above findings:

(a) Radioactive material was located in the upper right quadrant of the abdomen.

(b) The Thyroid contained 1.46 uCi of Iodine-131 and 1.61 uCi of Technetium-99m at the time of evaluation.

(3) Since the observations were completely inconsistent with the alleged incident on Sunday, 16 March 69, LTC Johnston had CPT Gotshall make an appointment for the individual at the Whole Body Counter. LTC Johnston notified Health Physics (SFC O'Neil) that an uptake of unknown origin had taken place and that the individual was to be at the Whole Body Counter at 1500 hours.

j. At about 1600 hours, Thursday, 20 March 1969, SFC O'Neil went to the Whole Body Counter and discussed the findings with MAJ Gardner. The individual had to be counted one crystal at a time, and even so the activity was too great to be handled by the instrument. Although resolution is not very good under 140 KeV, a great number of counts were found in this region (later found to be Technetium-99m). In the region of the thyroid, a large number of low energy counts and a clear Iodine-131 spectrum were obtained. SFC O'Neil then went to the Radioisotope Clinic and continued his investigation until all personnel had left for the day.

k. According to the subject technician, he returned to the Radioisotope Clinic at about 1800 hours, Thursday, 20 March 69, and performed a kidney scan on himself using the Phogamma. A 50,000 count scan was taken using Technetium-99m window settings and a scan of one "kidney" was obtained.

MEDEC-RS
SUBJECT: Report of Investigation

1. On Friday, 21 March 1969, the following occurred:

(1) At about 0800, LTC Johnston was given the "kidney" scan by the individual and at about 0830 he notified SFC O' Neil of the scan.

(2) At 0832 the undersigned was notified of the incident and, after making several telephone calls to verify details as they were known at that time, notified COL Andrew J. Colyer, MSC, Executive Officer, WRAMC at 0912 hours.

(3) At 0940 the undersigned arrived at the Radioisotope Clinic and initiated this investigation. A one (1) hour conference was held with LTC Johnston. Notification of the incident had been made by LTC Johnston to Chief, Radiology Service; Executive Officer, WRGH; and Chief, Department of Psychiatry and Neurology, WRGH.

(4) LTC Johnston rescanned the "kidney" using the Phogamma. With settings for Mercury-197 no scan was obtained; however, Technetium-99m settings produced a good scan of a single area below the kidney area. The evaluation of the "hot spot" in the upper right abdomen found by SP6 Blanton and CPT Gotshall early Thursday afternoon; the "kidney" scan taken by the subject individual on Thursday evening; and the scan taken by LTC Johnston on Friday morning are consistent with a mass of radioactive material (largely Technetium-99m) moving through the large intestine. This is corroborated by independent findings on the whole body counter and evaluation of a stool sample on Monday, 24 March 69.

(5) LTC Johnston reevaluated the individual using the Thyroid Probe and found 1 uCi of Iodine-131 <u>and</u> 1.2 uCi of Technetium-99m in his thyroid. A significant count rate of Technetium-99m was also found in the region of the liver and bladder. No quantification can be made of the latter data by this method.

(6) At about 1000 hours, the individual was again counted by MAJ Gardner in the Whole Body Counter. The following observations are made from the results of this evaluation:

(a) The thyroid still contained Iodine-131 and Technetium-99m

(b) The bolus in the gut had moved (Previously observed by LTC Johnston via kidney scans)

(c) The Technetium-99m in the upper part of the body had essentially tripled since 1500 hours the previous day.

(d) There had <u>NOT</u> been a significant decay of the Technetium-99m in the bolus in the gut even though 3 physical half-lives had elapsed and the residual activity should have been only 1/8th of the activity found

at the earlier counting. It should be noted that the whole body counter is not designed for specific localization and therefore some contribution would result from other areas where Technetium-99m had localized, including the bladder and the region of the liver.

(e) The above observations can only be explained by an additional uptake of Technetium-99m after 1600 hours, 20 March 1969. The finding of additional hot spots in the regions of the bladder and transverse colon support this hypothesis and indicate an ingestion which must have taken place before 2400 hours, 20 March 1969.

(7) At 1100 hours, LTC Johnston relieved the individual of his keys to the Radioisotope Clinic and subsequently of duty at the Radioisotope Clinic.

(8) At 1130 hours a urine sample was obtained from the individual for radiological assay by Health Physics. The urine contained Iodine-131 (0.054 uCi per liter ± 3.16 % @ 95% CL) and Technetium-99m (0.941 uCi per liter ±0.41% @ 95% CL). No other isotopes were found.

(9) At 1130 hours, the undersigned discussed with MG P.W. Mallory the findings, required reporting, and the scheduling of a special meeting of the Radioisotope Committee.

(10) At 1230 hours, the undersigned made the initial telephonic reports to OTSG and then to Region I, US Atomic Energy Commission (Mr. Gilbert).

(11) At 1400 hours, Mr. Nelson, Region I, US Atomic Energy Commission called the undersigned and discussed the incident.

(12) At 1550 hours, Mr. Charles Coner, Region I, US Atomic Energy Commission called the undersigned to advise that he would be at Walter Reed Army Medical Center on Monday, 24 March 1969 to conduct an investigation.

(13) During the afternoon, coordination was made with the following:

(a) MAJ Theodore R. Robertson, MC, Psychiatrist seeing the subject individual.

(b) MAJ Horace B. Gardner, MC, Whole Body Counter

(c) LTC Ray D. Beesley, JAG, Center Judge Advocate

(d) LTC Albert J. Luban, MSC, Troop Commander

(14) In the late afternoon, the individual was interviewed by MAJ Robertson who evaluated his mental attitudes at that time.

(15) In late afternoon, LTC Johnston administered Lugols Solution to himto accelerate clearance of the Iodine-131 and Technetium-99m from his body. Subsequent quantitative determinations are therefore biased by this necessary action and cannot be related to the original uptake.

(16) The individual was instructed to bring a stool sample to Radiology Service for pick-up on Saturday, 22 March 1969 by Health Physics for radiological assay. No sample was provided and, although the individual denied having had a bowel movement over the weekend, only one radioactive bolus remained in the large intestine on Monday, 24 March 69. This strongly indicates that the individual did have a bowel movement and failed to provide a sample as directed.

(17) A complete radiological protection survey was conducted during the afternoon by Health Physics and the results of that survey failed to reveal any evidence of an accident which could have accounted for his uptake.

m. On Monday, 24 March 1969, Mr. Charles Coner, USAEC conducted an investigation from 0900-1530 hours. He reviewed the available data, interviewed several persons, and agreed with our findings and conclusions at that time.

n. Since by 1530 hours, Monday, 24 March 1969 the individual claimed not to have had a bowel movement, LTC Johnston arranged for an enema to be performed to remove the radioactive material from the lower intestine. This reduced his exposure and provided a sample for radiological evaluation by Health Physics. The results of that evaluation at 1630, 24 March 1969 were:

Iodine-131	89.2 pCi gram ±3.9% @ 95% CL
Technetium-99m	28.7 pCi/gram ±4.9% @ 95% CL

o. The investigation and evaluations continued through Monday, 24 March 1969 and Tuesday, 25 March 1969. At 1600 hours, 25 March 1969 an interview was held with the individual by the undersigned and CPT Donald E. Stahl, MSC Assistant Health Physics Officer, WRAMC. The interview was relaxed and cordial. He talked freely and cooperated completely. The pertinent facts brought forth by him have been integrated into the report at their appropriate location. The individual tried to tell us everything and did not appear to be holding back, but he was unable to remember the details of events he could recall and omitted several events completely. He was unable to relate the events to their day or hour of occurrences with any effectiveness. He stated that recently he has had a lot of trouble remembering things. When questioned about recent

events, he in fact was unable to recall details or events. He frequently alluded to his devotion to duty of which he seemed quite proud. He seemed quite impressionable and care had to be taken not to introduce ideas because he would later "recall" them when the discussion returned to that item. This individual definitely stated that he did not remember ever drinking any radioisotopes and that he did not know of any accidents, other than the events on Sunday, 16 March 1969, which could have accounted for his uptake of radioactive material. Both statements seemed very carefully worded and not as spontaneous as his other comments. As possible explanations to the body burden, several areas were explained.

(1) The individual does not drink hard liquor, but does frequently drink beer at the bowling alley. He does not drink to drunkenness, but does recall a few headaches in the mornings over the previous 2 weeks. His drinking habits are corroborated by others who frequent the bowling alley.

(2) The individual does not use drugs and all who know him, including Dr. Robertson, his psychiatrist, feel that this is not consistent with his behavioral pattern.

(3) The medications he takes include: librium, tetralac, bismuth subcarbonate, ornade, darvon, and an antihistamine (pink and white capsule). He stated that he takes librium for stomach pains and a hernia. He does not know of any occasion when he may have taken librium and then drunk alcoholic beverages, but he could not be certain due to his difficulty remembering events and details. The opinion of the interviewing officers was the he was cooperative and truthful. We do not feel that he was consciously concealing facts. Numerous attempts were made to trap him into contradicting himself and he was consistent in each case. He was not allowed to present a rehearsed story, but was kept off balance by questions, returning to earlier statements, etc. We accept that the story as related by him is what he honestly believes happened, even though it is refuted by physical evidence and the statement of others.

p. On Wednesday, 26 March 1969, a special meeting of the WRAMC Radioisotope Committee was convened to consider this incident. The minutes of that meeting are contained in a separate document.

q. Additional evaluations are continuing on this individual including:

(1) A daily urinalysis for radioisotopes

(2) A weekly whole body count

(3) Continuing Group Therapy

(4) A Line of Duty Investigation

(5) A CBC with platelets

(6) At separation a physical examination to include:

(a) Whole Body Count

(b) CBC with platelets

(c) T-3 Test

(d) PBI Test

4. Analysis of Current Incident

a. There is no evidence to support accidental uptake or injection of radioactive material by the individual.

b. The findings on Monday, 17 March 1969, are consistent with an uptake of radioactive material by the individual between Sunday, 16 March 1969 and the morning of Monday, 17 March 1969. The most likely mode of entry was ingestion. No qualitative or quantitative statements may be made concerning these findings except that (1) from the localization of the material, the isotope(s) would be Iodine-131 and/or Technetium-99m and (2) from the counting rate observed, the quantity was in the diagnostic range for thyroid studies.

c. The findings on Tuesday, 18 March 1969, indicate approximately 2.5 uCi of Iodine-131 in the thyroid (assuming the Iodine-131 window was used for counting and the calculations were done correctly). No isotopic identification was attempted at this time.

d. Radioactive material, principally Technetium-99m, was found in the colon of the individual in the morning of Thursday, 20 March 1969 and traced to the sigmoid colon by the morning of Friday, 21 March 1969. Six independent measurements were made. The occurrences of Technetium-99m in the gut in any significant quantity can only be accounted for by ingestion of the radioisotopes. No estimate of the time of ingestion can be made due to the irregular eating and bowel habits of the individual, coupled with his use of antiacid compounds. A second area in the colon was found on Friday, 21 March 1969. A stool sample was obtained on Monday, 24 March 1969, Technetium-99m and Iodine-131 were found indicating ingestion of both isotopes.

e. Multiple ingestions of the isotope(s) is supported by (1) the occurrence of a second area in the colon on 21 March 1969, (2) the failure of the Technetium-99m to decay from 20 March - 21 March by a factor of 8 in accordance

with the physical half-life, (3) the change in the distribution of the isotope on Friday, 21 March 1969, (4) the fact that back calculation of the quantity of Technetium-99m which would have to have been ingested on Sunday, 16 Mar 69 to account for the findings on Thursday, 20 Mar 69 would have resulted in serious radiation damage to the thyroid, would have exceeded the Technetium-99m available at that time, and would have created a radioactivity level in the individual which would have interferred with his scanning patients early in the week.

f. It is the opinion of the physicians that he would not have subjected himself to any risk of significant radiation damage. This would be inconsistent with his personality and with the previous episode in which he was involved. Since he is quite knowledgeable in the use of radioisotopes in medicine, it is felt that many small ingestions to gain attention without significant risk are much more likely.

g. Dose calculations are impossible in this case since there were multiple ingestions of multiple isotopes occurring at unknown times. There were at least three separate ingestions and probably more (Sunday, 16 Mar, Monday, 17 Mar before 0800; (2) Evening of Wednesday, 19 Mar; and (3) Evening of Thursday, 20 Mar).

h. It is generally agreed that the maximum quantities which were ingested did not exceed 20 uCi of Iodine-131 and 10 mCi of Technetium-99m; however, this cannot be irrefutably supported by physical evidence.

i. It is interesting that he was instructed to report to the Whole Body Counter on three occasions before he actually reported to evaluation (17 Mar, 18 Mar, and 20 Mar 69). There is no acceptable reason given for this and the individual had no reason to fear the procedure since he had been counted on 20 Feb 69.

j. The following determinations were made from data obtained in the Radioisotope Clinic using the thyroid probe. This instrument has about 3% efficiency for Iodine-131 and substantially less for Technetium-99m. The error evaluation on the instrument indicates that the percent uptake (i.e. count from patient divided by count from standard taken over a like time period) is only accurate to ±3%. Considering the wide normal variation in the thyroid function this is quite adequate for diagnostic determination; but not for quantitative measurements of thyroid burden. The inconsistency of this data is adequately explained by this uncertainty.

Date and Time	Iodine-131 (uCi)	Technetium-99m (uCi)
18 Mar 69 (1400-1430)	2.5 uCi	
20 Mar 69 (1400)	1.46 uCi	1.61 uCi
21 Mar 69 (0900)	1 uCi	1.2 uCi

k. The results of a special radiation protection survey are included in Annex A to this report. They show that there is no evidence to indicate any accident of sufficient magnitude to account for the uptake in the work area.

l. The analysis of the results of the evaluations at the WRAIR Whole Body Counter are included in Annex B. Since this instrument is designed for quantitative determination of low levels of internally deposited radioisotopes, the body burden as determined by this method is the most reliable estimate available.

m. The results of the CBC with platelets performed on the individual on 3 Apr 69 is included as Annex C. LTC Ray A. Olsson, MC, a hematologist, evaluated the results and found all values within normal limits.

n. The results of laboratory evaluations performed by Health Physics as bioassays of feces and urine from the individual are included as Annex D.

5. The above report is complete and correct to the best of my knowledge and belief.

William F. Kendall
WILLIAM F. KENDALL
MAJ, MSC
Health Physics Officer

ANNEX A to
Report of Investigation, Radioisotope Technician, WRGH

REFERENCE OR OFFICE SYMBOL	SUBJECT
MEDEC-RS	Surveys of Radioisotope Clinic on 21 March 1969

TO	FROM	DATE	CMT 1
HPO, WRAMC	C, R&S Br, HP, WRAMC	16 Apr 69	

1. On 21 March 1969 by direction of the Health Physics Officer a Special Survey of the Radioisotope Clinic in Room 1, Bldg G-19, Walter Reed Army Medical Center was conducted by SP6 Troy R. Blanton, Health Physics, WRAMC.

2. The results were as follows:

a. Thirty-five wipes were taken in the areas noted on attached drawings.

b. All of the 35 wipes except one were less than 100 dpm/100 cm . One was 117.7 dpm/100 cm this wipe was taken from the radioactive disposal sink in the clinic.

c. A ten minute count was taken of the above wipes and a Gamma Spectrum analysis was done on all thirty-five wipes together. No identification of specific isotope(s) could be made.

d. A survey of the lab for contamination and gamma fields with an E-120 with HP 210 probe revealed nothing extraordinary.

e. From the information in and above it is concluded that there was no contamination in the either the laboratory or clinic that would indicate an accident.

f. Surveys taken on 19 March 69, 25 Feb 69 and 14 Jan 69 reveal substantially the same findings, i.e. contamination.

g. The survey included the usual canvas of personnel in the Isotope Clinic to determine any unusual procedures, incidents or unusual conditons existing. Nothing extraordinary was found.

3. In addition to the above, the chemical fume hood in the laboratory was also checked and found to be operating properly. The flow rate was checked with Alnor Velometer #27650. The flow rate was slightly higher than previously measured. The hood was remarked to reflect the current flow rate.

4. The technician's whole Body film badge (#574 "1" period) was removed by SP6 Blanton on the 21st of March and Badge #933 "1"period was issued to him. Badge #574 "1" period was forwarded to Lexington Blue Grass Army Depot for evaluation. On Wednesday 26 March telephone reply from Lexington revealed (The report from Lexington is attached).

5. Analysis of this information which is consistent with the usual findings in this area indicated that no significant spills or aerosolization of radioactive material occurred and that good routine cleanliness was in evidence. No unusual hazards existed in this area at the time of survey.

Donald E. Stahl
DONALD E. STAHL
CPT, MSC
C, R&S Br, HP, WRAMC

ANNEX B to
Report of Investigation, Radi[illegible]otope Technician, WRGH

REFERENCE OR OFFICE SYMBOL: MEDEC-ZJB

SUBJECT: Estimation of Isotopic Contamination in a Radioisotope Technician

THRU ~~Dir, Div of Nuclear Med~~ WRAIR

FROM Major H. Gardner
Whole Body Counting Fac.
Div of Nuclear Med.

DATE 10 April 1969

CMT 1

TO Major W. Kendall
Health Physics Officer
WRAMC

1. Assessment of isotopic contamination in an Isotope Technician ____. was carried out at the Whole Body Counting Facility, Division of Nuclear Medicine, on 20 February, 20, 21, 24, 26 March, 1 and 9 April 1969. The first of these counts was done as a routine check, and CPT Elizabeth Gotshall was counted on the same date. The other counts were requested by the clinic and Health Physics due to suspected contamination. Complete gamma ray spectrums were recorded on 20 February and 20 and 21 March for isotope identification. Only quantitative studies were done subsequently with a visual check of the spectrum for possible new contamination. Several patients from the Nuclear Medicine Section (Isotope Clinic) receiving known amounts of isotopes, as well as several small (geometrically) sources of known activity, were also counted in an attempt to quantitate the contamination.

2. The Whole Body Counter is a sensitive instrument designed to measure gamma emitters present in the body in nanocurie amounts. Above 500 nanocuries (0.5 microcurie) the results are non-linear functions of the amount present and require approximations of some uncertainty. A crude estimation of isotope localization is also possible.

3. The findings of the above indicate no detectable contamination of the above subject as of 20 February 1969 after many months of lab work handling isotopes. On Thursday 20 March it was evident that microcurie levels of isotopes were present. ^{131}I was definitely present, as well as a low energy gamma emitter suspected and later shown to be ^{99m}Tc. Gross localization showed the ^{131}I to be in the thyroid area; the ^{99m}Tc was predominantly in the RUQ of the abdomen. Estimation of ^{131}I in the thyroid yielded 1.4 microcuries (about 5 microcuries total body). The estimation for ^{99m}Tc is somewhat less reliable, but was in the 50-200 microcurie range. On Friday 21 March the ^{131}I est. and localization remained approximately the same (1.2 microcuries). The ^{99m}Tc would be expected to have decreased 8 fold (18 hrs. later, half-life of 6.04 hrs.) but had remained essentially unchanged (increased, if anything). More activity was now present in the thorax, while the abdominal activity was more midline and somewhat lower. By the following week, the ^{99m}Tc had disappeared, and the ^{131}I was decreasing as would be anticipated from its effective half-life. No additional isotopes have been noted.

4. Conclusion: It is the opinion of this investigator that the subject has been exposed to multiple isotopes (at least ^{99m}Tc and ^{131}I) on multiple occasions (at least one dose of ^{99m}Tc prior to Thursday 20 March, and one between the Thursday and Friday counts). These were probably in the diagnostic range, and 16 microcuries of ^{131}I in the thyroid on 21 February would represent an absolute maximum for I contamination. Since no time of ingestion of the Tc is available, back calculation is impossible. However, diagnostic levels are suspected due to availability and the probable use of a 1-2 millicurie dose the night of Thursday 20 March.

MEDEC-ZJB 10 April 1969
SUBJECT: Estimation of Isotopic Contamination in a Radioisotope Technician

5. Further evaluation: Since on 9 April 1969 it was estimated 0.24 microcuries of ^{131}I was all that remained in the thyroid, whereas the Report of Committee II on Permissible Dose for Internal Radiation (1959) recommends a thyroid content of no more than 0.7 microcurie, further follow-up will be done only per your request.

H. B. GARDNER
MAJ, MC
Whole Body Counting Facility

ANNEX C to
Report of Investigation, Radioisotope Technician, WRGH

COULTER COUNTER® "MODEL S" COULTER ELECTRONICS INC. HIALEAH, FLA.

Radioisotope Technician
Isotope Clinic, WRGH
Dr. Johnston Radioisotope Chemist

DATE DAY MONTH YEAR
4 0 3

0 7 9	TEST	NORMALS MALE	NORMALS FEMALE
0 6. 6 IF 99.9 RE-DILUTE	WBC X 10^3	4.8-10.8	4.8-10.8
5 . 2 2	RBC X 10^6	4.6-6.2	4.2-5.4
1 6. 0	Hgb gm	14-18	12-16
4 7. 8	Hct %	42-52	37-47
0 9 2.	MCV μ^3	82-92	82-92
2 9. 5	MCH $\mu\mu g$	27-31	27-31
3 2. 4	MCHC %	32-36	32-36

☒ DIFFERENTIAL

67	POLY.
	STAB.
27	LYMPH.
5	MONO.
1	EOS.
	BASO.
	BLAST CELLS
	MYELOCYTES
	METAMYELOCYTES
	NRBC/ 100 WBC
	ANISOCYTOSIS
1+	POIKILOCYTOSIS

NOTES:

adequate	☒ PLATELET
1	☐ RETIC
	☐ LEE WHITE
	☐ SED. RATE

CHARGE: DATE: REPORT BY: NURSE:

REMARKS: CLINICAL DIAGNOSIS: ☐ OR in AM ☐ EMERGENCY

CHECK PAGE 3 ☐ Hgb ☐ Hct ☐ WBC

D2.4

HEADQUARTERS
WALTER REED ARMY MEDICAL CENTER
Washington, D. C. 20012

14 April 1969

SPECIAL RADIOISOTOPE COMMITTEE MEETING

1. A special meeting of the Radioisotope Committee, as appointed by WRAMC Special Order 204, 17 September 1965, was held in Room 108A Walter Reed Army Institute of Research at 0930 hours, 26 March 1969.

a. The following members were present:

Colonel Nelson R. Blemly, MC, Assist Chief, Radiology Service, WRGH (Representing Colonel Longstreet Hamilton, MC, Chief, Radiology Service) Acting Chairman
Colonel John G. Maier, MC, Chief, Radiation Therapy, WRGH, Member
Colonel Michael A. Sulak, MC, Chief, Pathology Service, WRGH, Member
LTC Ray D. Beesley, JAG, Center Judge Advocate, non-voting member
LTC Gerald S. Johnston, MC, Chief, Radioisotope Clinic, WRGH, Member
LTC Charles E. Miller, MSC (Representing Colonel Philip L. LaManch, MSC, Director of Logistics Division, WRAMC) non-voting member
LTC Robert K. Modlin, MC, Chief, General Medicine Service, WRGH (Representing Colonel Robert H. Moser, MC Chief, Department of Medicine, WRGH) Member
LTC Ray A. Olsson, MC (Representing Colonel Marcel E. Conrad, MC Chief Department of Hematology, Division of Medicine, WRAIR)
Major William F. Kendall, MSC, Health Physics Officer, WRAMC Member
Major Charles M. Pyfer, MC, Radiologist USAMU, Ft. Detrick, Maryland Member
Captain Fredrick P. Siegal, MC (Representing Colonel Harold E. Ratcliffe, MC Preventive Medicine Officer) Member
Captain Donald E. Stahl, MSC Assistant Health Physics Officer, WRAMC, Recorder
Mr. Billy Bass, Civ, Chief, Department of Nucleonics, Division of Nuclear Medicine, WRAIR, Member

b. The following members were absent:

MG Philip W. Mallory, MC, Commanding General, WRAMC, Chairman
Colonel John L. Bradley, MC, Chief, Professional Services, WRGH Vice-Chairman
LTC David M. Ginsberg, MSC, Chief, Department of Biophysics, Division of Nuclear Medicine, WRAIR, Member
LTC Merrill C. Johnson, MC, Chief, Department of Radiation Biology, Division of Nuclear Medicine, WRAIR, Member
LTC Dorsey T. Mahin, MC, Director, Division of Nuclear Medicine, WRAIR, Member

c. The following were invited guests:

Major Horace B. Gardner, MC, Whole Body Counting Facility, WRAIR
Major Donald Powell, MSC, Troop Command, WRAMC
Major Theodore R. Robertson, Chief Resident, Psychiatry Service, WRGH

2. The meeting was called to order by Colonel Blemly, Assistant Chief, Department of Radiology, Acting Chairman, at 0935 hours.

3. Since this was a special meeting of the Radioisotope Committee no old business was discussed.

4. Major Kendall opened by stating that the purpose of the Special Radioisotope Committee meeting was to investigate the circumstances of an alleged overexposure of a technician working in the Radioisotope Clinic, WRGH. Major Kendall presented a lengthy report of the investigation conducted. The report dealt in detail with an alleged injury during a brain scan, the refutation of this injury by witnesses, the past history of the individual, the many evaluations of his bocy burden in the radioisotope clinic and at the Whole Body Counter, the evaluations made of the work area, the statements of the technician's associates, and many other matters. A transcript of this meeting is available.

5. LTC Johnston expanded on MAJ Kendall's report and discussed the technician's previous behavior in some detail. LTC Johnston estimated that the amount of 131-Iodine involved was less than 25 microcuries and speculated that the entire incident was another attempt by the technician to draw attention to himself. LTC Johnston also commented on his exceptional competence as a radioisotope technician.

6. MAJ Gardner related his role in evaluating the technician in the Whole Body Counter. The technician had been counted on 20 Feb 69 and no body burden was found which differed from the population at large. Although the instrument is designed to measure 0.5 microcuries or less, studies performed with clinically dosed patients subsequent to the incident indicate that the technician had a body burden of 50-200 microcuries of 99m-Technetium on Thursday, 20 Mar 69 and the same or a little more on Friday, 21 Mar 69. The absence of radioactive decay, as well as the distribution of the isotope in the body, indicate that a subsequent ingestion occurred between the evaluations. Subsequent evaluation have been consistent with normal physical and biological processes. MAJ Gardner identified 99m-Technetium and 131-Iodine in the technician's thyroid.

7. MAJ Robertson discussed the psychiatric status of the technician. He has a diagnosis of situational maladjustment with a predisposing schizoid personality. This is a character-behavior disorder and leads to acting things out rather than engaging in verval communication with others. He does have some capacity to adjust and is included in the Group Therapy Program. He is not psychotic and does not have a thinking disorder.

He was seen again on Friday, 21 Mar 69 when the investigation began and was not psychotic and had not had a dissociative reaction at that time.

8. An extensive discussion of the matter was held by the committee which probed every point and opinion rendered.

9. The conclusions of the Committee were:

a. Multiple isotopes are involved - specifically 131-Iodine and 99m-Technetium.

b. Multiple exposures took place, including some radioactive material that was present on Tuesday, probably 131-Iodine, and 99m-Technetium. From the findings at the Whole Body Counter, a possible additional ingestion on Wednesday evening and another on Thursday is suspected. The total number of ingestions and the times at which they occurred are based on the best possible evaluation of the available data and do not rule out other ingestions.

c. It is believed that all of the exposures were within or below the diagnostic range.

d. Evidence indicates that there was not enough radioactive material ingested to do clinical damage to the technician.

e. Based on the findings of the investigation it is inconceivable that the incident was the result of an accident.

f. The incident was the result of actions performed by an individual with a character-behavior disorder.

g. Further pursuit of the investigation will not reveal substantially any more related facts than are now available.

h. Additional facts bearing on the matter which are uncovered as a result of other investigations (e.g. Line-of-Duty, etc) will be pursued.

i. Dose calculations should not be made unless greater confidence can be attained in the quantities ingested and the times of uptake.

10. The following recommendations were proposed by the Committee.

a. That the individual be routinely followed until such time as he returns to normal or instrumental background levels of activity as determined at the Whole Body Counter.

b. That he be again counted on the Whole Body Counter at the termination of his term of active duty.

c. That he receive a CBC with platelet count at this time and at his termination of active duty.

d. That a T-3 and/or PBI Test be accomplished at the time of his separation from active duty.

e. That no punitive action be recommended.

f. That he be considered for administrative separation under AR 635-212.

g. That a Line of Duty Investigation be accomplished on the individual.

h. That the individual not be assigned to any duties which place him near any significant occupational hazards.

i. That he be assigned where he can be closely supervised.

II. There being no further business the meeting was adjourned by Colonel Blemley at 1110 hours.

Nelson R. Blemly
NELSON R. BLEMLY
COL, MSC
Acting Chairman

Donald E. Stahl
DONALD E. STAHL
CPT, MSC
Recorder

Approved.

Philip W. Mallory
PHILIP W. MALLORY
Major General, MC
Commanding

DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20012

IN REPLY REFER TO
MEDEC-RS

MAY 1 1969

SUBJECT: Notification of Technical Overexposure

THRU: Commanding General
Walter Reed General Hospital
ATTN: Chief, Radiology Service
Washington, D.C. 20012

TO: [redacted] Ex 6

Enlisted Company
Walter Reed General Hospital
Washington, D.C. 20012

1. This report is furnished to you under the provisions of the Atomic Energy Commission regulations entitled "Standards for Protection Against Radiation" (10 CFR Part 20). You should preserve this report for future reference.

2. On 20 March 1969, Health Physics discovered during a routine survey in the WRGH Radioisotope Clinic that you had incurred an internal exposure to radioisotopes, specifically Technetium-99m and Iodine-131.

3. A subsequent investigation revealed that there were one or more ingestions, apparently self inflicted, and that they began on or about Sunday, 16 March 1969.

4. Owing to reluctance or inability on your part to recall all of the facts surrounding this incident it has not been possible to estimate your total uptake or internal exposure.

5. A special meeting of the WRAMC Radioisotope Committee was convened on 14 April 1969 to consider this matter and reached the following conclusions:

MAY 1 1969

MEDEC-RS
SUBJECT: Notification of Technical Overexposure

a. That all of the exposures were within or below the diagnostic range.

b. That there was not enough radioactive material ingested to do clinical damage to you.

c. That it was inconceivable that this incident was the result of an accident.

d. That dose calculations should not be attempted unless greater confidence can be attained in the quantities ingested and the times and dates uptake occurred.

5. This Committee recommended that no punitive action be taken against you, that you not be assigned to duties which place you near any significant occupational hazards, and that you be assigned to duties where you can be closely supervised.

FOR THE COMMANDER:

R. Nystrom Jr.
R. NYSTROM, Jr.
LTC, MSC
Adjutant

DEPARTMENT OF THE ARMY
WALTER REED ARMY MEDICAL CENTER
WASHINGTON, D.C. 20012

IN REPLY REFER TO
MEDEC-RS

MAY 1 1969

IDENTIFICATION DATA

Reference is made to Report of Overexposure of a Radioisotope Technician assigned to Walter Reed General Hospital, during March 1969.

The following information is furnished in compliance with 10 CFR Part 20.403(c).

Ex. 6

a. Name:

b. Social Security Account Number:

c. Date of Birth:

d. Status: Radioisotope Technician, Radioisotope Clinic, Walter Reed General Hospital, Washington, D.C. 20012

William F. Kendall
WILLIAM F. KENDALL
MAJ, MSC
Health Physics Officer
WRAMC