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PAGES: 13 12 ^{RES}

PHONE: _____

DATE: NOV. 13, 2006

RE: mail control #
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CC: _____





139595
NMSS/RGNI MATERIALS-002



Krueger-Gilbert Health Physics, Inc.

3601 EAST JOFFA ROAD
BALTIMORE, MARYLAND 21234
(410) 665-KGHP (5447) FAX (410) 665-2074

August 18, 2006

RADIATION PROTECTION SURVEY REPORT

ATTENTION: Khalid Abonsy, M.D.
Virginia Nuclear Cardiology

The following report contains our findings and recommendations with regard to personnel dosimetry, facility design and equipment, postings, review of required records and results for surveys and tests performed at the time of this site visit.

The survey criteria employed by Krueger-Gilbert Health Physics, Inc. are those of the National Council on Radiation Protection and Measurement, Report No. 105, "Radiation Protection for Medical and Allied Health Personnel", Report No. 30, "Safe Handling of Radioactive Materials", and the Nuclear Regulatory Commission and the State of Virginia.

DEPARTMENT: Nuclear Medicine

FACILITY: Virginia Nuclear Cardiology
8505 Arlington Boulevard
Suite 350

CITY AND STATE: Fairfax, VA 22031

SURVEY DATE: August 1, 2006

Any questions regarding this report should be directed to Wendy Charlton, Health Physicist.

(n 0806 Virginia Nuclear Cardiology-Fairfax)ch

Virginia Nuclear Cardiology
Radiation Protection Survey
Survey Date: August 1, 2006

RADIATION PROTECTION SURVEY REPORT

RADIOACTIVE MATERIAL AUTHORIZED

Virginia Nuclear Cardiology, Inc. is authorized to possess and use radioactive material under NRC License Number 32-25619-01 and VA-508-03. This NRC license will expire on March 31, 2013 and the Virginia license will expire on February 1, 2007. An NRC inspection of the license on May 20, 2003 demonstrated no violations.

Radioactive material is limited to the types and quantities listed below:

<u>Material</u>	<u>Possession Limit</u>
10CFR 35.200	As needed for cardiac imaging
Co-57 (sealed source)	30 mCi
Tl-201 (any form)	200 mCi
Ga-67 (liquid)	1 mCi

PERSONNEL MONITORING REQUIREMENTS

1. The technologist was noted to be wearing extremity and whole body dosimetry devices properly.
2. Dosimetry records were reviewed for the first quarter of 2006. One employee exceeded ALARA Level I for the time period. An ALARA Review is attached.

FACILITY DESIGN & EQUIPMENT

1. Adequate facilities were provided for the safe storage, preparation and use of radioactive materials so that radiation levels in adjacent areas did not exceed acceptable standards and were as low as reasonably achievable.
2. Vial shields, syringe shields and syringe holders were available for use by the staff.
3. Two radiation survey meters were on hand at the time of the survey.

The Ludlum Model 14C SN 191960 survey meter with 44-9 probe was last calibrated on May 25, 2006. This meter is equipped with a dedicated check source. The exposure range for this meter is 0 to 2000 mR/hr.

The Ludlum Model 14C SN 191430 survey meter with 44-9 probe was last calibrated on February 3, 2006. This meter is equipped with a dedicated check source. The exposure range for this meter is 0 to 2000 mR/hr.

Virginia Nuclear Cardiology
Radiation Protection Survey
Survey Date: August 1, 2006
Page 2

REQUIRED POSTINGS

1. Radiation caution signs, emergency notification, the radioactive materials license and agency form "Notice to Employees" must be posted. At the time of the survey, emergency notification was not posted.
2. Reference to the location of the State regulations for control of ionizing radiation, as well as the supporting documentation for the license, must be posted.
3. It is recommended that a radioactive material prescribed dosage schedule be developed, approved by an authorized user, and posted at the dosage preparation area in the Hot Lab.

RECORD REVIEW

1. The following health physics records were reviewed:
 - A. Radioactive material receipt: Incoming packages must be surveyed for exposure and contamination as well as checked for contents and package condition. The survey form provides written documentation of the following:
 - Date of receipt
 - Package condition
 - Radiation levels: surface, at one meter, background
 - Wipe test results: outside surface and background
 - Detector efficiency
 - Description of instruments used
 - Technologist's initials

Records reviewed for May and June, 2006 were complete.
 - B. Radiopharmaceutical administration records: Unit doses are being provided by a commercial pharmacy. Administration records should include:
 - Prescription label (radionuclide description)
 - Patient name
 - Activity administered
 - Time of administration
 - Technologist's initials

Dose administration records are maintained on the dose ticket.
 - C. Molybdenum breakthrough records: Radionuclide purity is assessed by the commercial pharmacy. As per prescription labels, molybdenum content is less than 0.15 μCi ^{99}Mo per mCi $^{99\text{m}}\text{Tc}$ at expiration. Doses must be used prior to stated expiration.

Virginia Nuclear Cardiology
Radiation Protection Survey
Survey Date: August 1, 2006
Page 3

RECORD REVIEW (continued):

D. Radioactive material shipment log: Unused doses and contaminated syringes will be returned to the radiopharmacy. These returns are made as "limited quantity" shipments. Outgoing packages must be surveyed for exposure and checked for removable contamination before release. Records should be maintained and include the following:

- Surface survey (mR/hr)
- Wipe test (net dpm)
- Technologist's initials
- Confirmation package meets limited quantity specifications.

E. Radioactive waste disposal: The facility holds radioactive waste for decay in storage. At the time of the survey, there was waste in storage. The intended waste disposal log must contain the following information:

- Date of storage
- Description of material
- Date of disposal
- Survey results (background and surface of container)
- Survey device used
- Technologist initials

As a reminder, waste should always be surveyed in a low background area prior to release.

F. Dose calibrator records:

All radiopharmaceuticals must be assayed for activity to an accuracy of ± 10 percent. The most common instrument for accomplishing this is an ionization type dose calibrator. The instrument must be checked for accurate operation at the time of installation and periodically thereafter. The following tests are required:

- Instrument constancy (daily)
- Instrument accuracy (at installation and annually thereafter)
- Instrument linearity (at installation and quarterly thereafter)
- Geometric variation (at installation)

An Atomlab 100 #3333918 ionization type dose calibrator is used for assaying patient doses. A review of the required dose calibrator tests was conducted with the following findings and recommendations:

NOTE: A geometric variation evaluation was available for the dose calibrator. However, there was no date for the evaluation. If the date of the evaluation cannot be located, the evaluation should be repeated.

Virginia Nuclear Cardiology
Radiation Protection Survey
Survey Date: August 1, 2006
Page 4

RECORD REVIEW (continued):

F. (continued):

1. Daily Instrument Constancy

Instrument constancy means that there is reproducibility within a stated acceptable degree of precision in measuring a constant activity over time. The dose calibrator constancy should be evaluated over the range of photon energies and source activities used clinically.

Records indicate that instrument constancy has been evaluated for Cesium-137 and Cobalt-57 on a daily basis. Survey results must be within +/-10% of the predicted activity.

2. Instrument Accuracy

The accuracy of the dose calibrator for Cesium-137 and Cobalt-57 was assessed at the time of this visit and found to be acceptable. This test is performed by Krueger-Gilbert Health Physics, Inc. as part of the quarterly service.

3. Instrument Linearity

The linearity of a dose calibrator must be ascertained on a quarterly basis over the entire range of activities used clinically down to 30 microcuries. Corrective action must be taken if the measured activity deviates by more than ± 10 percent from the calculated activities. A decay linearity was acceptable in February, 2006. A linearity was in progress at the time of this survey.

G. Sealed source inventory and leak test records: As per State regulations, sealed sources must be inventoried on a quarterly basis and tested for leakage at intervals not to exceed 6 months. Krueger-Gilbert Health Physics, Inc. conducted a physical inventory and sealed source leak test at the time of this visit. These results are reported under a separate cover.

H. Daily area survey records: Exposure rates are measured each day in areas where radioactive materials are prepared, injected and stored. Corrective action must be taken when trigger levels are exceeded.

Records for May through July, 2006 were below the trigger levels.

I. Weekly area survey records: Wipe testing for detection of spreadable contamination must be conducted on a weekly basis in areas of injection, preparation, use, and storage. Corrective action must be taken when the trigger level (2000 nct DPM) is exceeded.

Results for May through July, 2006 were below the trigger level.

J. Daily personnel monitoring log: Results must be documented for daily hand surveys. Survey results must be equivalent to background level, or corrective action must be implemented. Recent records were acceptable.

Virginia Nuclear Cardiology
Radiation Protection Survey
Survey Date: August 1, 2006
Page 5

RECORD REVIEW (continued):

- K. Camera Quality Control: Daily uniformity is checked extrinsically using a Co-57 flood source.
- L. Training: Nuclear Medicine staff completed a self-teaching package in May, 2006.

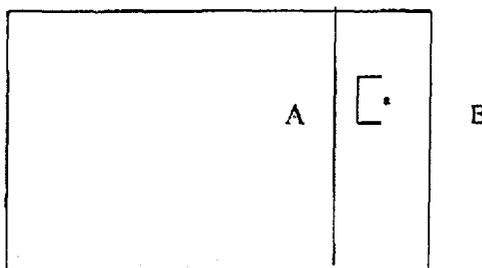
Virginia Nuclear Cardiology
 Radiation Protection Survey
 Survey Date: August 1, 2006
 Page 6

AREA SURVEY

1. Radiation levels were measured in areas of typical personnel occupancy. The results were as follows:

	<u>mR/hr</u>
Background Level:	0.02
Waist level in front of the Nuclear Lab doorway:	0.02
Waist level in center of Scan Room:	0.03
Eye level in front of radioisotope storage area:	0.05
Waist level in front of radioisotope storage area:	0.03
Eye level in front of radioisotope preparation area:	0.02
Waist level in front of radioisotope preparation area:	0.03
Surface of cold trash receptacle:	0.03
Treadmill surface:	0.02

Instrument used: Ludlum Model 14C SN# 191430
 Last Calibration date: February 3, 2006



	<u>mR/hr</u>
A = Sealed source storage area	0.05
B = Hallway	0.03

2. Wipe testing for detection of spreadable contamination was performed. Results indicated that there was no spreadable contamination in excess of 200 dpm per 100 cm².

Virginia Nuclear Cardiology
 Radiation Protection Survey
 Survey Date: August 1, 2006
 Page 7

DOSE CALIBRATION ACCURACY TEST AND SEALED SOURCE LEAK TEST

1. The department's sealed sources were inventoried and leak tested. A certificate is attached.
2. The Atomlab 100 dose calibrator (SN#3333918) was checked for its accuracy, using NBS traceable sources. The results were as follows:

<u>ISOTOPE</u>	<u>TRUE ACTIVITY (mCi)</u>	<u>MEASURED ACTIVITY (mCi)</u>	<u>CALIBRATOR RANGE</u>	<u>DIAL SETTING</u>	<u>PERCENT ERROR</u>
Co-57	0.402	0.385	mCi	Co-57	4.4%
Co-57 (Tc-99m eq.)	0.474	0.462	mCi	Tc-99m	2.1%
Cs-137	0.189	0.180	µCi	Cs-137	4.7%
Cs-137 (I-131 eq.)	0.244	0.230	µCi	I-131	2.1%

The above values are within acceptable limits for this facility.

SOURCES USED:

Cobalt-57: NAS, MED 3550, SN #33228, Calibration 9.79 mCi, 03/01/03

Cesium-137: NAS, MED 3550, SN #35424, Calibration 204 µCi, 04/01/03

Any questions regarding the above should be addressed to the undersigned.

Krueger-Gilbert Health Physics, Inc.

Wendy Charlton

Wendy Charlton
 Health Physicist



Krueger-Gilbert Health Physics, Inc.

3601 EAST JOFFA ROAD
BALTIMORE, MARYLAND 21234
(410) 665-KGHP (5447) FAX (410) 665-2074

August 18, 2006

Facility: Virginia Heart, Inc.

SEALED SOURCE INVENTORY AND LEAK TEST CERTIFICATE

Conducted: August 1, 2006

Leak test procedure: Wipe external surface of container and analyze in Ludlum well detector (2 x 2 inch NaI). Counting time will be dependent upon background levels and selected so that a minimum detectable activity of 0.001 μ Ci is obtainable. Detailed procedures and equipment quality control results are on file at the office of Krueger-Gilbert Health Physics, Inc.

(SOURCES IN USE/AVAILABLE)

<u>Isotope</u>	<u>Manufacturer</u> <u>Serial No.</u>	<u>Activity/</u> <u>Calibration Date</u>	<u>Leak Test Results</u> <u>Removable Activity (μCi)</u>
Cs-137 (vial)	NAS MED 3550 35424	204 μ Ci 04/01/03	Less than 0.001
Co-57 (vial)	NAS MED 3550 33228	9.79 mCi 03/01/03	Less than 0.001
Cs-137 (rod)	NAS MED 3400 33752	0.111 μ Ci 03/01/03	Inventory only
Co-57 (flood)	Benchmark BM09100098	10 mCi 06/30/05	Less than 0.001
Co-57 (flood)	Benchmark BM04100015	10 mCi 04/28/03	Less than 0.001

Any questions regarding the above should be addressed to the undersigned.

Krueger-Gilbert Health Physics, Inc.

Wendy Charlton
Wendy Charlton
Health Physicist

Reviewed by: _____
Radiation Safety Officer

_____ Date



Krueger-Gilbert Health Physics, Inc.

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August 18, 2006

SUMMARY OF FINDINGS

ATTENTION: Khalid Abonsy, M.D.
Virginia Nuclear Cardiology

DEPARTMENT: Nuclear Medicine

FACILITY: Virginia Nuclear Cardiology
8505 Arlington Boulevard
Suite 350

CITY AND STATE: Fairfax, VA 22031

SURVEY DATE: August 1, 2006

There were no negative findings at the conclusion of this survey.

Any questions regarding this report should be directed to Wendy Charlton, Health Physicist.

Virginia Nuclear Cardiology
ALARA REVIEW
First QUARTER OF 2006

The following Investigation Levels have been established in order to monitor individual occupational external whole body radiation exposures.

EXTERNAL DOSE	INVESTIGATIONAL LEVELS (mrem per calendar quarter)	
	LEVEL I	LEVEL II
1. Deep dose equivalent	125	375
2. Eye dose equivalent	375	1125
3. Shallow dose equivalent to skin	1250	3750
4. Shallow dose equivalent to extremity	1250	3750

Review of the dosimetry reports for the above stated quarter indicated the following:

1 Persons exceed Level I
0 Persons exceed Level II

Name Tonya Horton 146 mrem

Name _____

Name _____

Action Taken:

Radiation Safety Officer

Date

This signed report should be kept on file for State/Federal inspection.

Prepared by Krueger-Gilbert Health Physics, Inc.:

By: Wendy Charlton Date: August 1, 2006