

**Supporting Statement B**

**U.S. NUCLEAR MEDICINE TECHNOLOGISTS STUDY**

**May, 2016**

This submission was formerly titled:

Cancer Risk in U.S. Radiologic Technologists: Fourth Survey  
(2011 OMB submission)

OMB No. 0925-0656, Expiration Date 4/30/2015

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## ATTACHMENTS

1. ***U.S. Nuclear Medicine Technologists Study Nuclear Medicine Procedures Questionnaire***
2. **Revisions and Additions to Previously-Approved Questions**
3. **Contact Documents**
  - A. **Recruitment Email**
  - B. **Follow-up Email**
4. **Consent Information Sheet**
5. **Institution Review Board Approvals**
  - A. **National Cancer Institute**
  - B. **University of Minnesota**
6. **Privacy Act Memo**
7. **Privacy Impact Assessment**

## SUPPLEMENTARY DOCUMENTS

- S1. ***U.S. Radiologic Technologists Study Radioisotope Procedures Questionnaire*** (OMB No. 0925-0656)
- S2. ***U.S. Radiologic Technologists Study General Questionnaire, Work History Section*** (OMB No. 0925-0656)

## B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

### **B1. Respondent Universe and Sampling Methods**

The proposed U.S. Nuclear Medicine Technologists (USNMT) Study is in follow-on to the U.S. Radiologic Technologists (USRT) Study that has been underway since 1982. The USRT cohort includes radiologic technologists who were certified by the American Registry of Radiologic Technologists (ARRT) during 1926-1980. The universe from which USNMT Study respondents are to be drawn includes an estimated 25,000 nuclear medicine technologists who were certified by the ARRT and/or the Nuclear Medicine Technologist Certification Board (NMTCB) in 1980 or later. This estimate is based on the rate of growth of this field, the number of nuclear medicine technologists reported to be in the workforce by the Bureau of Labor Statistics, United States Department of Labor, in May 2014 ([www.bls.gov/oes/current/oes292033.htm](http://www.bls.gov/oes/current/oes292033.htm)) and certification and registration information provided by the ARRT. The precise number of eligible technologists will be determined as part of the current study. Technologists will be eligible for the feasibility study if they are currently alive, residing in the U.S., are not members of the U.S. Radiologic Technologists (USRT) cohort, and have email addresses available.

### **B2. Procedures for the Collection of Information**

Computer-assisted web interview (CAWI) technology will be used for all information gathering. Prior to sending an e-mail invitation to participate in the study, the master file of eligible nuclear medicine technologists will be checked against the most recent vital status records available. These will include annual recertification records from the ARRT and NMTCB and vital status updates compiled using the National Death Index and Social Security Administration mortality

databases. E-mail addresses will be obtained from the most recent annual renewal update information from the ARRT or NMTCB. From the approximately 25,000 individuals certified in nuclear medicine technology in 1980 or later who have available email addresses (the sampling frame), a total of 1,500 technologists (the sample) will be selected for the feasibility study. We plan to oversample technologists certified in positron-emission topography (PET) to ensure that there will be a sufficient number of participants from this group to get an accurate estimate of their likely occupational radiation exposures. We will randomly select 250 technologists from among those certified in PET and randomly select the remaining 1,250 technologists from among those certified in all other nuclear medicine specialties. The invitation letter will be sent via e-mail and will explain the purpose and objectives of the study. The email will include notes of support from the Executive Directors of each certification organization and a link to the web-based questionnaire. Non-responders will be sent a second, third, and fourth email invitation, as needed, approximately three, six, and nine weeks after the first contact. At any point, technologists who refuse to participate will not be approached again and will be considered non-respondents in the final analysis.

### **B3. Methods to Maximize Response Rates and Deal with Non-response**

The main objectives of the current effort are to determine if a sufficiently large cohort of nuclear medicine technologists can be identified, a CAWI questionnaire can be successfully administered, and individual occupational radiation doses can be accurately estimated using the collected information. To maximize response, up to three follow-up emails will be sent as noted above. Because this is a feasibility study, intensive efforts will not be made to obtain updated email addresses or missing addresses for technologists who are not currently certified. If an expanded is

deemed feasible, contact will be made by mail and intensive efforts will be made to obtain current addresses..

To ensure good communication and provide greater reciprocity with study participants, the research objectives, progress to date, study findings, and published papers will be posted on a USNMT study-specific homepage on the U.S. Radiologic Technologists Study website (<http://radtechstudy.nci.nih.gov/>).

#### **B4. Test of Procedures or Methods to be Undertaken**

The nuclear medicine questionnaire to be used for the USNMT feasibility study (**Attachment 1**) is a minor revision of the USRT fourth survey nuclear medicine questionnaire (**Supplementary Document S1**). The latter was completed by 6,311 USRT cohort members who reported performing nuclear medicine procedures at least once a month for a year or more in the work history section of the USRT fourth survey general questionnaire (**Supplementary Document S2**) that was completed by 58,677 USRT members. Input was obtained from nuclear medicine experts and nuclear medicine technologists in developing the USRT fourth survey nuclear medicine questionnaire. All fourth survey questionnaires underwent extensive evaluation and testing, and no problems were encountered during administration.

Pre-testing of the online survey will be conducted with up to nine nuclear medicine technologists to assess usability, including ease of access, navigation, and flow, and understanding of questions. Based on feedback from the technologists, recommendations may be made to improve clarity and/or access. Since all but a handful of the questions on the proposed USNMT questionnaire were successfully completed by more than 6,300 USRT cohort members, problems with specific questions are not anticipated. If initial recruitment emails bounce back, email addresses will be reviewed and corrected for obvious errors. Quality control

reviews will be performed throughout testing and administration of the questionnaire. During the pre-test phase, skip patterns, internal consistency, and screen presentation will be evaluated. Collected data will be extracted and reviewed for accuracy and completeness, and to ensure that the electronic version of the questionnaire fully complies with the paper specifications. The pre-test quality control reviews will be repeated again after questionnaires have been collected from another 50 nuclear medicine technologists. A preliminary data file will be evaluated to verify the accuracy of data capture. The final data file will be reviewed for potential discrepancies in gender, date of birth, and other variables.

#### **B5. Individuals Consulted on Statistical Aspects and Individuals Collecting and/or Analyzing Data**

The University of Minnesota is under contract to the NCI (HHSN261201500257P) to support this research effort. The Project Director is Bruce H. Alexander, PhD, Division of Environmental Health Sciences (telephone 612-625-7934, email [balex@umn.edu](mailto:balex@umn.edu)). The University of Minnesota will maintain the rosters of eligible nuclear medicine technologists from the ARRT and NMTCB and the information collected by questionnaire. Social & Scientific Systems, Inc. (SSS) is under contract to the NCI (HHSN261201400010I) to provide general support services for this effort. SSS developed the nuclear medicine CAWI questionnaire and will be responsible for ensuring that the system is working properly. The SSS Project Director is Janet Archer (telephone 919-287-4334; email [jarcher@s-3.com](mailto:jarcher@s-3.com)). The Contracting Officer Representative from the Radiation Epidemiology Branch, DCEG, NCI who is responsible for overseeing the data collection is Michele Doody, Staff Scientist (telephone 301-518-6001, email [doodym@mail.nih.gov](mailto:doodym@mail.nih.gov)). The USNMT Study Principle Investigator is Dr. Cari Kithara. Other study investigators include Drs. Martha Linet and Vladimir Drozdovitch. Dr. Ethel Gilbert, a

Statistician in the Radiation Epidemiology Branch, NCI, provided statistical consultation for the study protocol and will be consulted throughout the study as necessary.