

## D. Special Procedures and Bioassays

### 1. Iodinations

- a. Radiation workers who wish to perform an iodination (work involving “free” or “unbound” radioactive iodine) must notify Radiation Safety **prior to** performing the experiment.
- b. Radiation workers performing iodinations will be required to obtain a thyroid scan within 72 hours of the procedure (waiting at least 6 hours for distribution of the majority of the iodine to the thyroid). A baseline scan shall be performed on new users prior to beginning work with radioactive iodine.
- c. The iodine concentrations in the breathing zone air of the user and in the exhaust air from the hood will be measured whenever an iodination procedure is performed. The concentrations are determined by passing a known air volume through activated charcoal-filled tubes. The radiation worker performing the iodination is responsible for picking up the breathing zone tube and Iodination Schedule Form, from Radiation Safety, prior to starting the experiment. The RSO/RSS will be responsible for collection of the tubes and their assay. The following information will be provided to the RSO/RSS with each sampling tube:
  - i. The rate at which air was drawn through the tube in liters per minute
  - ii. The sampling time interval
  - iii. The iodine isotope used in the experiment
  - iv. The date of the procedure
  - v. The name(s) of the employee(s) performing the iodination.
- d. Iodinations must be performed in a chemical fume hood or an approved biological safety cabinet equipped with a charcoal filter. Hoods to be used for iodinations must be pre-approved by Radiation Safety. Radioactive iodine is not to be used in any activity levels in air circulation hoods.
- e. The RSO will determine the type of hood or cabinet, airflow requirements, and filtration requirements.

### 2. Thyroid Scans

- a. Radiation workers authorized to use radioactive iodine (bound or unbound) must receive a baseline thyroid scan prior to manipulating radioactive iodine. The RSO/RSS will contact new employees to schedule a scan.

- b. Radiation workers performing iodinations must receive a thyroid scan in accordance with section 1.b. above.
3. Urine Bioassays
- a. Radiation workers performing high-activity experiments involving the use of 10 mCi or more of H-3, C-14, S-35, P-33, or P-32 at one time must submit a urine bioassay sample between 12 hours and 72 hours after performing the experiment. Bioassays for experiments involving 10mCi or more of other radionuclides will take into account biological decay, and will be performed in a time frame that ensures effectiveness for assessing potential body burden. The RSO/RSS should be notified of the expected use and approximate time of use in advance, whenever possible.
  - b. Urine bioassay specimen cup(s) and the [Mandatory Urine Bioassay Memorandum](#) requesting information about the experiment such as: isotope, activities, time, etc., will be delivered to the radiation worker along with the radioisotope.
  - c. Declared pregnant radiation workers, certain animal facility radiation workers, and NCI-Frederick waste management staff must submit monthly urine bioassay samples. A memo and specimen cup will be mailed from Radiation Safety to each radiation worker on the Urine Bioassay Program at the beginning of each month.

**Failure to submit a required urine bioassay sample may result in suspension of isotope-use privileges.**

4. Declared Pregnant Workers
- a. Pregnant radiation workers may “declare” their pregnancy. If one chooses to declare one’s pregnancy, it must be done in writing to Occupational Health Services (OHS) using the “[Declaration of Pregnancy/Pregnancy Interview Certificate](#).”
  - b. A member of the Radiation Safety Office will be contacted by OHS to be present during the pregnancy interview. The RSO/RSS can answer questions concerning the declaration process and will distribute a folder containing the following information.
    - i. [NRC Regulatory Guide 8.13](#)
    - ii. Bioassay Declaration – to be signed and returned
    - iii. [Form to withdraw declaration](#)
  - c. If the radiation worker chooses to declare her pregnancy (she may choose not to if she wishes), a fetal monitoring badge (if applicable) will be provided, and necessary bioassays will be determined based on isotope type and usage indicated on the individual’s Radiation T&E Form(s).

- d. Declared radiation workers approved for any isotope use must submit monthly urine bioassays and those approved for radioactive iodine use must obtain a monthly thyroid scan. Radiation Safety will send memos out at the beginning of each month as reminders of these bioassay requirements.
- e. Separate monthly exposure reports from our dosimeter provider will be sent to the individual. The dose to the embryo/fetus will be limited to 0.5 rem. The lower dose limit for the embryo/fetus should remain in effect until the woman withdraws the declaration in writing or the woman is no longer pregnant. If a declaration of pregnancy is withdrawn, the dose limit for the embryo/fetus would apply only to the time from the estimated date of conception until the time the declaration is withdrawn. If the declaration is not withdrawn, the written declaration may be considered expired one year after submission.
- f. Radiation Safety will notify the radiation worker when any exposure has been detected by a fetal monitoring badge or during a bioassay. An investigation of possible causes will be pursued to determine how to prevent future exposures and to determine whether the reported exposure is valid.
- g. Radiation Safety will make every effort to maintain confidentiality of the radiation worker during the pregnancy.