Nuclear Medicine Physics Course
Laboratory 5: Area Wipe Test

What we will do
Perform a set of weekly wipe tests and surveys of working environment tests for integrity and cleanliness. These instructions are general and describe one way of getting the job done. During this exercise you will be assisted by a staff person. They might proceed a little differently. Follow their instructions and complete the area survey requirements. Answer all questions and turn in completed lab to Dr. Wagner.

Why do we do this?
Keeping the workplace free of radioactive contamination is an essential component of a quality program. Verification that the workplace is clean is an essential component of good practice and is required by regulation. Routine wipe tests is a test to check working surfaces for contamination that might end up on a person’s clothes, hands or food. When performed regularly, these tests assure that any sloppy behavior will be detected early so that it can be corrected.

In addition to wipe tests, visual surveys and surveys with exposure rate detectors (ionization exposure rate meters or Geiger counters) are further tests used to assure safety and cleanliness.

Perform survey and surface contamination of working areas:

- Obtain a map of the department that shows the areas to be surveyed and wipe tested.
- Get an exposure rate meter (Geiger counter or ionization chamber) and test to make sure it is working properly.
- Make sure the serial number is recorded on the form and look at the calibration date of the meter to make sure it was calibrated within the last year. All these details are necessary to comply with regulation.
- Measure and record the exposure rates at all places indicated on the map for meter surveys.
- Turn off the meter and return it to its proper storage location.
- After recording the data, determine whether or not the rates are under the compliance limits. Controlled areas must not exceed 2 mR/h and uncontrolled areas must not exceed 0.25 mR/h.

Wipe testing areas where radiopharmaceuticals are prepared, administered or stored is required by the code of federal regulations (10CFR35 and the State of Texas) and must be performed at least weekly. Surface contamination in these tests is not permitted to exceed 1000 DPM per 100 cm$^2$. Area wipe test that looks for removable radioactive contamination can be performed by swabbing at least 100cm$^2$ areas using an absorbent material and then counting the samples in a NaI(Tl) well counter. Now obtain several test tubes and cotton swabs to perform the wipe tests of working areas. Mark each test tube for the location on the map that is to be wiped. Wipe test an area of at least 100 cm$^2$ for each swab and each area. Take your swab to the scintillation well detector.
1. On the home page of the system select “weekly wipe” test.
2. Select “area wipe tests” and check off the areas for which you took wipes.
3. Place one test tube with clean swab into the well counter and cover the well and take a background count (1 minute). (Expect background to be about 100 - 200 counts for a 1-minute count time.) Accept the background and press count for the next wipe.
4. When the system tells you to insert a specific wipe, insert the corresponding test tube, then press OK.
5. When the system stops counting accept the count and repeat procedure for all wipes.
6. When done exit the page and print the report for all the wipes.
7. Compare the results with permitted limits and decide whether you need to decontaminate the wiped areas. Indicate pass or fail on the forms.
8. Describe a simple technique often used in nuclear medicine departments to decontaminate a work surface.

Answer the following questions:

How do counts per minute differ from disintegrations per minute? ________________________________

What type of detector must be used for this test? ________________________________

What is the “efficiency” of a detector? ________________________________

Is there a different correction factor for Tc-99m as opposed to I-131? ________________________________

After you answer the questions turn in a copy of the document for credit to the Physics and Education Offices.

Resident Name (print): ______________________________________

Completed lab on: ___/___/______

Signature of individual supervising lab: _________________________