

## Quick-Reference Guide to Assess—a Program to Help Hospital Staff Use Gamma Cameras to Assess Accidental Intakes of Radioisotopes

**Note to Users:** This guide is intended to assist in entering data and displaying results. It does not provide guidance for acquiring the data and interpreting the results, which is provided in a separate instruction manual.

Assess includes three screens for user input and output. The first screen is displayed when the program opens—you can return to it by pressing the *Patient* tab in the upper left-hand corner of each screen. The other two screens are marked *Camera* and *Energy Windows*. The use of these screens is discussed below. On some computer display monitors, the first screen may overflow the size of the display. Scroll bars are provided on the right and bottom sides of the screen to enable you to see the rest of the screen.

1. *Patient*: The screen consists of four panels. The panels are discussed in counter-clockwise order, starting with the upper left-hand corner.
  - a. First Panel (upper left-hand side of screen)
    - i. Last name of the patient—required
    - ii. First name—optional
    - iii. Age—required. Actual age must be entered for all patients under 25
      - (1) For older patients, select “25 or older”
      - (2) For infants under 1 year, enter age in months.
    - iv. Sex—required for patients over 15 years old
    - v. Weight of patient—specify weight if patient is less than 15 years old. This entry is optional; however, entering the weight enables a more accurate assessment since body size affects the count rate for a given intake.
  - b. Second Panel (lower left-hand side of screen)
    - i. Date and time counts were measured—required. The correct date and time are important, since the counts will change with time.
    - ii. Background counts—required
      - (1) “Anterior view” and “Posterior view” refer to the detectors used for the two views. If counts are performed on successive patients following the background counts, all patients must face in the same direction, so that the same detector will always be used for the anterior view, likewise for the posterior.
      - (2) You have a choice of four units: cpm, kcpm, total counts, or total kcounts. You can use whichever units are most convenient. For total counts or total kcounts you must also enter the counting time in minutes. The same counting time will appear in the window for the second detector. However, you can change this entry if the counting times were different for the two detectors.

- (3) Background counts should be measured with all patients out of the camera room and repeated periodically.
- iii. Patient counts—required: Record the patient counts in the same manner as described for background counts, above.
- c. Third Panel (lower right-hand side of screen)
  - i. Principal mode of intake—required: If the patient was exposed to radioactive material that was dispersed as an aerosol or airborne dust, the intake was by inhalation. If the individual consumed radioactively contaminated food or drink, the intake was by ingestion.
  - ii. Date and time of intake: Enter the actual date and time the patient inhaled or ingested the radioactive material. Assessments cannot be performed if the intake was less than 1 hour or more than 30 days before the time the patient was counted with the gamma camera.
  - iii. Principal isotope: Any of the six listed radioisotopes can be assessed by this program. The isotope should be identified by radiation professionals.
  - iv. Lung absorption type—required for inhalation of  $^{60}\text{Co}$ ,  $^{90}\text{Sr}$ , or  $^{192}\text{Ir}$ . A field will appear to the right of the principal isotope selection buttons listing the different lung absorption types for any of these three isotopes. F, which stands for fast, M for medium, and S for slow refer to the speed with which different chemical forms of the isotope are absorbed by the lungs. The various chemical forms corresponding the lung absorption types of each isotope are also listed. If the chemical form is unknown, select the type that corresponds to “unspecified compounds.”
- d. Fourth Panel (upper right-hand side of screen)
  - i. Choose units for displaying results—conventional units: intake in  $\mu\text{Ci}$  (microcuries), doses in rem; or SI units: intake in MBq, doses in mSv.
  - ii. Press “Calculate Results” only after you have reviewed or revised entries in the next two screens.

## 2. Camera

You need to specify the model of the gamma camera. The three choices are Siemens e.cam, Philips SKYLIGHT, or “Other.” Once the camera is specified, you will see schematic diagrams of patient positions with respect to the camera heads based on the age or weight of the patient as entered in the *Patient* screen. Select the view that most closely resembles the actual position used for counting the patient. If unsure, select diagram 1, which is usually appropriate for the selected camera.

## 3. Energy Windows

If you selected either Siemens e.cam or Philips SKYLIGHT in the *Camera* screen, you will see a set of primary energy windows which are recommended for counting the specific isotope. For the Siemens e.cam and any isotope except  $^{241}\text{Am}$ , you will see an alternate set of windows with fewer channels. The primary set produces the greatest sensitivity; the alternate set involves few channels and may be quicker to set up, but makes the camera somewhat less sensitive. There is no alternate set of windows for the Philips SKYLIGHT. For any camera, you can enter a custom

set of windows that were actually used for counting the patients—this is the only available choice if the camera is specified as “Other.”

#### 4. Results

After all entries are completed, return to the *Patient* screen and press “Calculate Results.” The calculated intake, the cumulative effective dose from the time of intake to the time you press the button (not to the time the counts were measured), and the committed lifetime dose in the absence of medical intervention are displayed in the specified units. Press “Print Results” to produce a one-page report on the individual patient that lists the calculated results as well as all the information you have entered.

The information on each patient is saved to a text file in the *Patient* subfolder that can be viewed and printed using the Microsoft Notepad program that is furnished with Microsoft Windows or any other text editor. The file is named according to the following convention: *lastname\_firstname\_dddmmmm.txt*, where *ddd* is the Julian date (the number of days since December 31 of the previous year) and *mmmm* is the number of minutes since midnight.

#### 5. Next Patient

Pressing “Next Patient” will reset all the patient-specific data. New entries must be made as follows.

- a. The patient’s name
- b. The patient’s age will be reset to “25 or older”; you must make a new entry if this is not correct.
- c. The patient’s sex if the age is 15 or older
- d. The weight should be entered if the patient is younger than 15.
- e. The date the counts were measured will be reset to today’s date—it must be changed if this is not correct.
- f. The time will be reset to midnight—a new time must be entered.
- g. The background counts will not be reset, but should be re-entered if the background counts have changed since the previous patient was counted.
- h. The patient counts, and count time if applicable, must be entered.
- i. All other entries will remain unchanged. However, you should review these entries to make sure they are still valid.