ANNEX 2: SAFETY CONSIDERATIONS

Radiopharmaceuticals, owing to their detrimental effects on cellular structures, need to be monitored for their harmful effects on the personnel involved in handling them. Critical operations include manufacture, storage, transport, compounding, testing, dispensing and administration to the patients.

In order to minimize the harmful effects of radiopharmaceuticals ALARA principle should be implemented. A major consideration of the ALARA principle includes exposure time, distance and radiation shielding. These factors should be carefully considered while designing the safety protocols for radiopharmaceuticals.

Radiation signs

Restricted area	<0.02 mSv/h and 1 mSv/h
Caution, Radiation Area	may exceed 0.05 mSv/h at 30 cm from source
Caution, High Radioactive Area	may exceed 1 mSv/h at 30 cm from source
Danger, Very High Radiation Area	may reach 5 Sv/h at 1 m from source
Caution Radioactive Material	37 GBq for Cs-137 and Sr-89 37 MBq for Mo-99, I-123 and Co-57 370 MBq for Tc-99m, Ga-67 and Xe-133.

Radiation safety instruments

GM survey meters	Laboratory survey
Portable ion chambers (cutie pies)	High level exposure rate monitoring
Pocket dosimeter	Personnel exposure monitoring
Wipe test counters	GM counters to detect low level activity
Film badges	To detect and measure personnel exposure
Thermoluminescent dosimeters	More sensitive than film badges
Scintillation detectors	

Portable radiation contamination monitor for radioactive contamination survey of lab surfaces. Well-type scintillation detector with a single channel analyser for measurement of wipe tests. NaI detector with gamma ray spectrometer to identify and quantify gamma emitting radionuclides.