

Summary

Trial Manufacture of a Plunger to Reduce Finger Exposure

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According to the results of a survey conducted by the Japanese Society of Nuclear Medicine Technology in 1995, the mean monthly exposure dose to the trunk of nuclear medicine technicians was less than 0.2 mSv at more than 75% of the institutions, whereas the exposure dose to the fingers exceeded 0.5 mSv at 30% of the institutions. Many recent radiopharmaceuticals are being supplied as the syringe type, and while the syringe is surrounded by a tungsten or lead-glass shield, there is no shielding of the syringe needle or the plungers. The plastic plunger provides little shielding effect, and even when a tungsten plunger is used, calculating back from the leakage rate, the

shielding effect for ^{99m}Tc is approximately 75%. We therefore trial-manufactured a plunger devised in such a manner as to considerably reduce exposure of the fingers and evaluated its shielding effect from leakage rate obtained with a dual-detector scintillation camera when the radionuclides ^{99m}Tc , ^{67}Ga , ^{201}Tl , and ^{123}I were used. Its performance was satisfactory, with shielding effects (^{99m}Tc , 99%; ^{67}Ga , 95%, ^{201}Tl , 95%; ^{123}I , 73%) about the same or better than back-calculated from the leakage rates.

Key words: Shielding effect, Finger radiation exposure, 360°-direction leakage rates, Leakage rate.