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Radiopharmaceutical management of $^{90}Y/^{111}In$ labeled antibodies: shielding and quantification during preparation and administration

Formijn J. VAN HEMERT,* Gerrit W. SLOOF,* Kirsten J.M. SCHIMMEL,* Walter L. VERVENNE,** Berthe L.F. VAN ECK-SMIT* and Ellinor BUSEMANN-SOKOLE*

*Departments of *Nuclear Medicine and **Oncology, Academic Medical Center, Amsterdam, the Netherlands*

Background: The combined application of potent β-emitting isotopes for therapy with γ-emitting isotopes for scintigraphy requires a profound regimen concerning team member safety and radionuclide quantification. ***Methods:*** We have developed materials and methods for a proper and easy manipulation of ^{90}Y during preparation and administration of $^{90}Y/^{111}In$ pharmaceuticals used for radioimmunotherapy. ***Results:*** The efficacy of the shielding measures is documented. Protocols for the calibration of γ-dose calibrators with respect to ^{90}Y are extended to the assessment of quench-corrected liquid scintillation counting of ^{90}Y. The contribution of ^{90}Y backscatter to ^{111}In counting is quantified. Newly developed shielding equipment allows an adequate administration of relatively large volumes (100 m*l*) of $^{90}Y/^{111}In$ labeled pharmaceuticals to patients. ***Conclusions:*** The procedures described combine pharmaceutical (Good Manufacturing Practice) and radiation safety requirements with an accurate logging of relevant data.

Key words: radiopharmaceutical, radioimmunotherapy, radiation protection, radionuclide calibration, quench correction