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# Radiological protection — Measurement for the clearance of waste contaminated with radioisotopes for medical application —

## Part 2: Management of solid radioactive waste in nuclear medicine facilities

*Radioprotection — Mesurage pour la libération des déchets contaminés par des radioisotopes lors des applications médicales —*

*Partie 2: Gestion des déchets radioactifs solides dans les installations de médecine nucléaire*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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# Foreword

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This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 2, *Radiological protection*.

A list of all the parts in the ISO 19461 series can be found on the ISO website.

# Introduction

Nuclear medicine is the branch of medicine which uses in vivo radioactive tracers, also called radiopharmaceuticals, to evaluate molecular, metabolic, physiologic or pathologic properties in human beings and animals for diagnosis, monitoring and therapeutic purposes. The use of radionuclides in medicine is a well-established practice. Their favourable physical properties allow a broad use of radionuclides in vivo, in modern medicine. As a result, a wide range of radioactive waste is produced. Most of it is considered biomedical radioactive waste. The amount and types of wastes varies depending on the scale of the nuclear medical facility, the medical applications, and the involved radionuclides.

Radioactive waste generated in nuclear medicine facilities does not present a significant long term waste management problem when compared to wastes generated from nuclear fuel cycle operations, for instance. The most important characteristics of biomedical radioactive waste produced in nuclear medicine are its short half-life and low radiotoxicity. It generally contains low-energy photon emitters (<511 keV), but also alpha and beta ($\beta^+$ and $\beta^-$) emitters. It is usually of low total and specific activity. Nevertheless, the volume of radioactive waste produced can be significant, and other associated hazards may be present, such as biological and physical risks.

The radioactive waste produced is mainly in solid or liquid form. The liquid form is associated with patient urine, since it is the main elimination mechanism of radiopharmaceuticals. Liquid waste can also be associated with the washing water of potentially contaminated material or residues of syringes, vials, etc. This liquid waste possesses a particular management problem that falls outside the scope of this document. Liquids in small quantities contained in vials and syringes are generally managed as solid waste and their management is part of this document.

When planning for the handling of radionuclides in nuclear medicine facilities, it is important to design an effective program for the overall management of the biomedical radioactive waste. This includes all steps or activities involved in the management of radioactive waste from its generation to ultimate preparation for discharge or disposal. The goal is to minimize the hazards posed by radioactive waste, including the associated biological and physical hazards.