Measurement and prediction of the ambient dose equivalent from patients receiving iodine 131 administration after thyroid ablation —

Part 1: During the hospitalization

Mesurage et prévision de l’équivalent de dose ambiant de patients bénéficiant d’un traitement par iode 131 après ablation de la thyroïde —

Partie 1: Pendant l’hospitalisation
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO’s adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document ISO/TC 85, Nuclear energy, nuclear technologies, and radiological protection, Subcommittee SC 2, Radiological protection.

A list of all the parts in the ISO 18310 series can be found on the ISO website.
Introduction

ISO 18310 addresses measurement methods and procedures of ambient dose equivalent rate from patients administered with $^{131}$I.

The incidence of thyroid cancer has increased in recent years. Thyroid cancer can be treated by administering radioiodine, because radioiodine selectively accumulates in thyroid tissue to irradiate and kill the cancerous cells. Thyroid cancers are small and not likely to develop into aggressive malignancies. Earlier diagnosis and treatment can remove these cancers at a time when they are not likely to have spread beyond the thyroid gland.

However, due to the radiation emitted from patients during treatment, the patients nearby or the caregivers could also receive the dose. For this reason, a normative way to assess the dose to persons close to the patient treated with radioiodine should be implemented. There are two common practices for the treatment of thyroid cancer, one is a radioiodine administration without thyroid resection, and the other is the administration after thyroid resection. In recent years, the radioiodine administration after surgery has become more common.

The most commonly used radionuclides for the treatment is $^{131}$I. $^{131}$I mainly emits 364 keV of photon energy with a few other photons and its radiological half-life is 8.02 d. The administered iodine is absorbed in the digestive system, concentrated in the thyroid gland through blood circulation and after a few hours, excreted into the bladder, and released through urine and faeces. For the patient who had the thyroid removed, the retention time in the body is shorter than that for a patient who has not had thyroid removal.

This document deals with the determination of ambient dose equivalent rate at a distance from the patient treated with radioiodine therapy procedure. It is based on the estimation of the dose rate using ionization chamber base dosimetry.

For the purpose of the ISO 18310 series, this document is focused on the determination of the ambient dose equivalent rate from the patient. The uncertainty of the ambient dose equivalent is also provided.
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