ICS 11.040.50

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PHARMACEUTICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

YY/T 1869-2023

Detector array measurement system - Performance characteristics and test methods

探测器阵列剂量测量系统 性能和试验方法

Issued on: January 13, 2023 **Implemented on: July 15, 2024**

Issued by: National Medical Products Administration

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1.Structure and Drafting Rules for Standardization Documents" drafting. Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document is proposed by the State Drug Administration. This document is prepared by the National Medical Electrical Appliances Standardization Technical Committee Radiotherapy, Nuclear Medicine and Radiation Dosimetry Equipment Standardization Sub-Technical Committee Meeting (SAC/TC10/SC3) centralized. This document was drafted by: Beijing Institute of Medical Device Testing, Peking University Third Hospital, Pedway Radiation Measuring Instruments (Beijing) Co., Ltd. Co., Ltd., Yibia (Beijing) Particle Accelerator Technology Co., Ltd., Varian Medical Devices Trading (Beijing) Co., Ltd. The main drafters of this document. Fu Guotao, Yang Ruijie, Jiao Chunying, Liu Di, Xu Lin, Wang Shun, Zhang Xin. Performance and Test Method of Detector Array Dosimetry System

1 Scope

YY/T 1869 covers the detector array dose measurement systems used in radiotherapy

quality assurance, the panels of detectors that verify a treatment plan actually delivers the dose distribution it was designed to. It specifies the performance characteristics such a system must have and the test methods that establish them, covering dose response and linearity, spatial resolution, reproducibility, angular dependence and the corrections applied to the raw reading. These systems sit between the planning computer and the patient: if the array itself is not characterised, the verification it performs proves nothing. Intensity-modulated and volumetric-arc treatment cannot be delivered safely without patient-specific quality assurance of this kind. For a manufacturer of dosimetry equipment this is the standard a Chinese registration is assessed against.

This document specifies the performance and test methods of the detector array dosimetry system (hereinafter referred to as the array system). This document is applicable to the detector array dosimetry system, including the detector array and supporting measurement software and result analysis software.

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text. Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document.

GB 9706.201 Medical electrical equipment Part 2-

3 Terms and Definitions

The following terms and definitions defined in GB 15213-2016, GB 9706.201 and GB/T 17857-1999 apply to this document.

3.1 An array composed of multiple detectors, and a dosimetry system composed of supporting measurement software and result analysis software are used to measure The dose distribution after the radiation therapy equipment is projected, and compared with the dose distribution calculated by the treatment planning system, and the radiation dose is determined according to the specified standards. Whether the dose distribution of the treatment equipment meets the requirements after irradiation.

4 Requirements

4.1 Random files Random documents should contain at least the following.

a) detector type;

b) Dimensions and sensitive volume of a single detector;

c) The number and spatial distribution of detectors;

d) the effective detection range of the detector array;

e) The actual thickness, composition, material, density and water equivalent thickness of the detector array;

f) Sensitivity of the detector array and its influencing factors;

g) Types of measurement rays, energy response ranges, dose ranges and dose rate ranges;

h) The minimum time sampling interval and charge collection time for measurements;

i) energy dependence of the detector array;