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**NATIONAL OCCUPATIONAL HEALTH STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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**Requirements for radiological protection in diagnostic
radiology
(English Translation)**

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1 Scope

This Standard specifies requirements for protection in diagnostic radiology, including protection performance of X-ray imaging diagnosis and interventional radiology equipment, equipment room protection facilities, protection safety operation requirements and related protection testing requirements.

This Standard is applicable to X-ray imaging diagnosis and interventional radiology.

X-ray imaging equipment in radiotherapy and nuclear medicine shall be implemented in accordance with this Standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 18871, Basic Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources

GBZ 128, Specifications for individual monitoring of occupational external exposure

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 X-ray imaging diagnosis

a technology that uses X-ray penetration and other properties to obtain image information of human organs and tissues to diagnose diseases

3.2 C-arm X-ray equipment

the X-ray equipment for diagnosis that is composed of C-frame, X-ray tube assembly and image intensifier (or dynamic flat panel detector), of which the frame and X-ray tube combination can be rotated in one or two directions

3.3 mobile X-ray equipment the mobile medical X-ray equipment that is used carry out operations such as bedside X-ray photography or fluoroscopy

3.4 X-ray diagnostic equipment installed on vehicle

the fixed X-ray equipment installed on medical X-ray diagnostic vehicle; it usually is composed of X-ray generator, X-ray imaging device, bed, table, bracket and other auxiliary equipment

3.5 portable X-ray inspection equipment an on-site use inspection device that uses X-rays to conduct safety inspection and personnel rescue; it is usually carried directly by operator to operate on site

3.6 interventional radiology a technology that, under the supervision and guidance of the medical imaging system, through percutaneous needle puncture or introduction of catheters, performs suction injection, drainage or shaping, perfusion, embolization for lumens and blood vessels to diagnose and treat diseases

4.1 Management requirements

Medical institutions shall be responsible for the protection and safety of radiation workers, subjects and the public, mainly including.

4.2.3 All new types of medical exposure techniques and methods, before use, shall be judged for legitimacy. Types of medical exposure that have been judged to be justified, when new or important evidence is obtained and a new judgment is required, shall be re-judged for legitimacy. When using all new medical exposure techniques and methods that have passed the justification judgment, they shall be strictly controlled within the scope of their indications. To use new indications, a separate judgment for legitimacy must be made.

4.2.5 When the group inspection enables the public to gain enough benefits to

compensate for the economic and social costs (including radiation hazards), this kind of inspection is legitimate.

4.2.6 X-ray diagnostic group inspection shall prohibit the use of ordinary fluoroscopy inspection methods. Unless there is a clear indication of disease risk, X-ray computed tomography (CT) shall not be used for physical examination.

4.2.9 Mobile and portable X-ray equipment shall not be used for routine inspections. Only when it is not possible or medically does not allow the subject to be sent to a fixed device for examination, and after taking strict corresponding protective measures, can mobile or portable X-ray equipment be used to operate at the bedside. Perform medical imaging examination.

4.3.1 The basic goal of optimizing the protection of subjects in X-ray diagnostic and interventional radiology procedures is to maximize the benefits beyond the hazards.

4.4.1 Quality assurance program for radiological diagnosis

It shall develop a quality assurance program for radiological diagnosis, including.

4.5 Others

4.5.1

See Annex B for X-ray equipment room protection testing.

4.5.2 See Annex C for lead equivalent of different shielding substances in medical diagnostic X-ray protection.

5.1 General requirements

5.1.1

On the outlet of X-ray equipment, a beam limiting system shall be installed (such as beam limiter, diaphragm).

5.1.4

Accompanying documents shall describe the following protection-related properties.

5.2 Special requirements for protective performance of X-ray equipment

for fluoroscopy

5.2.1

The minimum focal distance of the C-arm X-ray equipment shall not be less than 20cm. The minimum focal distance of another X-ray equipment for fluoroscopy shall not be less than 30cm.

5.4 Special requirements for protection performance of CT equipment

5.4.1

Before the scanning process starts, it shall specify CT operating conditions used during a scan procedure.

5.4.2

For any CT scan procedure, it shall display dose information on the operator console.

5.5 Special requirements for protection performance of X-ray equipment

for dental photography

5.5.1 The nominal value of the tube voltage when using dental X-ray equipment

shall not be less than 60kV.

5.8.2 In the machine room, there shall be control keys for the staff to successfully switch between fluoroscopy and photography functions without changing the operating position.

5.9 Special requirements for protection performance of X-ray diagnostic

equipment installed on vehicle

5.9.1

X-ray diagnostic equipment installed on vehicle shall meet special requirements for protection performance of its corresponding device type.

5.9.2

X-ray diagnostic equipment installed on vehicle shall be equipped with beam limiting device to ensure that the X-ray does not exceed the plane of the image receiver.

6.1.1 X-ray equipment, doors, windows and pipeline ports of the machine room

shall be set up reasonably. Try to avoid direct exposure to doors, windows, pipeline openings and staff operating positions with useful harnesses.

6.1.5 Except bedside photography equipment, portable X-ray equipment and

X-ray diagnostic equipment installed on vehicle, with regard to the X-ray equipment machine room for new construction, reconstruction and expansion projects and technological transformation and technology introduction projects, the minimum effective use area and minimum unilateral length shall meet the requirements of Table 2.

6.4 Workplace protection of X-ray equipment