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WS

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

WS/T 76-1996

Replacing WS 530-2017; WS 581-2017; WS 522-2017; WS 521-2017; WS 520-2017; WS 518-2017; WS 76-2017

**Specification for quality control and testing of medical X-ray
diagnostic equipment
(English Translation)**

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References

Foreword

3.1~3.9, 3.10.1~3.10.8, 3.10.10~3.10.14 of this standard are mandatory clauses, and the rest are recommended clauses.

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces WS 76-2017 "Specifications for Quality Control and Testing of Medical Routine X-ray Diagnostic Equipment", WS 518-2017 "Breast X Specification for Quality Control and Inspection of Radiographic Screen Photography System, WS 520-2017 "Specification for Quality Control and Inspection of Computer X-ray Photography (CR)", WS 521-2017 "Medical Digital X-ray Photography (DR) System Quality Control and Testing Specifications", WS 522-2017 "Digital Breast X-ray Specification for Quality Control and Inspection of Photographic System, WS 530-2017 Specification for Quality Control and Inspection of Mammography System, and WS 581-2017 "Specifications for Quality Control and Testing of Dental X-ray Equipment". Compared with the above standards, the main technical changes except for editorial changes are as follows.

- Modified the determination requirements for low-contrast resolution in fluoroscopy X-ray equipment (see 4.4, 7.5 of WS 76-2017);
- Added the detection of the surrounding dose equivalent rate on the detection plane of the fluoroscopy protection zone (see 4.7 and Appendix I);
- Deleted the inspection requirements for the deviation between the irradiation field and the image receiver center in the X-ray fluoroscopy equipment (see WS 76-2017 7.8);
- Deleted the status detection requirements of the output linear items in the X-ray photography equipment (see WS 76-2017, 6.3);

- Deleted the detection requirements for the deviation of the light field and the center of the irradiation field in the X-ray photography equipment (see 6.8 of WS 76-2017);
- Modified the detection method of residual image in digital X-ray photography equipment (see 9.5, 6.6 of WS 521-2017);
- Deleted the detection requirements of the automatic exposure control (AEC) sensitivity item in the digital X-ray photography equipment (see WS 521-2017) 6.10.1);
- Deleted the test requirements for the AEC tube voltage change consistency item in the digital X-ray photography equipment (see WS 521-2017 6.10.3);
- Delete the detection requirements for dark noise items in digital X-ray photography equipment (see 6.1 of WS 521-2017);
- Added DSA equipment quality control test items and methods (see Chapter 6);
- Added a comparison table of test items for medical X-ray diagnostic equipment (see Table A.1);
- Modified the requirements for the maximum kerma kinetic energy rate of the air entering the body surface of the fluoroscopic examinee (see Table B.1, Table B.1 of WS 76-2017);
- In the high-dose rate mode, the requirement for the maximum value of the kerma kinetic energy rate of the air entering the body surface of the fluoroscopic examinee is added (see Table B.1);
- Increased the high contrast resolution requirements of flat panel detectors (see Table B.2);
- Modified the requirement of the air kerma kinetic energy rate in front of the maximum incident screen of the flat panel detector (see Table B.4, Table B.3 of WS 76-2017);
- Improved the half-value layer requirements for different target/filter combinations in mammography (see Table F.2);
- Added an example of the DSA equipment quality control test phantom (see Appendix L);
- Added examples of low-contrast resolution detection phantoms for mammography equipment (see Appendix O).

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1 Scope

This standard specifies the general requirements, test items, and test methods for quality control testing and protective performance testing of medical X-ray diagnostic equipment and its technical requirements.

This standard applies to the quality control testing and protection performance testing of medical X-ray diagnostic equipment, including X-ray photography equipment [including X-ray screen Film photography equipment, digital X-ray photography (DR) equipment, computer X-ray photography (CR) equipment], X-ray fluoroscopy equipment (including direct fluorescence Screen fluoroscopy equipment, image intensifier fluoroscopy, flat-panel fluoroscopy equipment), dental X-ray equipment (including intraoral and extraoral machines), digital subtraction blood DSA X-ray equipment, mammography equipment [including mammography equipment (breast screen), digital mammography equipment Radiography (breast DR) equipment, mammography (breast CR) equipment].

Mobile X-ray equipment, portable X-ray equipment, vehicle-mounted X-ray equipment, lithotripter and medical conventional X-ray simulation positioning equipment can be used refer to use.

This standard does not apply to the quality control testing of X-ray computed tomography (CT) devices and cone beam CT.

2 Terms and definitions

The following terms and definitions apply to this document.

Digital radiography (DR) equipment A medical imaging device that uses digital X-ray image detector technology to achieve X-ray photography. Its image directly from the image detector Readout is usually composed of X-ray generating device, digital X-ray imaging device and mechanical auxiliary device.

Computed radiography (CR) equipment Reusable imaging plate is used instead of intensifying screen-film is used as the carrier to be exposed by X-ray, and the potential is obtained after exposure with laser scanning imaging plate.

Image information is collected and amplified by an optical system, and collected by a computer to obtain a digital image display of X-ray photography equipment.

Digital subtraction angiography; DSA an angiographic imaging technique that uses computers to process digital continuous photographic image information to eliminate (subtract) bone and soft tissue images Surgery.

Image receptor

A device used to directly convert incident X-rays into a visible image, or into a device that