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**INDUSTRY STANDARD OF THE
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**Virtual print information interaction specification of medical
digital imaging
(English Translation)**

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Foreword

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

This standard was proposed by the National Health Standards Committee Information Standards Committee.

This standard was drafted. First Affiliated Hospital of China Medical University, University of Electronic Science and Technology, National Health and Family Planning Commission Statistical Information Center, country University General Hospital, Tongji Medical College of Huazhong University of Science and Technology, West China Hospital of Sichuan University.

1 Scope

This standard specifies the technical content of the medical digital image virtual printing information interaction process.

This standard applies to all types of medical and health institutions, medical equipment manufacturers, medical image storage and archiving systems (PACS) at all levels of the country.

Manufacturers and manufacturers of radiology information systems (RIS) are also suitable for software development and evaluation of medical digital image virtual printing.

2 Normative references

The following documents are indispensable for the application of this standard. For dated references, only the dated version applies to this standard.

quasi. For undated references, the latest edition (including all amendments) applies to this standard.

DICOM Standard.2011 (Digital Imaging and Communications in Medicine.2011)

3 Terms and definitions

The following terms and definitions apply to this document.

Virtual print virtual print Use software to simulate physical printers, generate electronic print files from print client data, and implement and physical print processes simultaneously A printing method that keeps the communication consistent.

4 Abbreviations

The following abbreviations apply to this document.

DICOM Digital Imaging and Communications in Medicine DIMSE DICOM Information Service Element ID identification number (Identity) LO long string (Long String) LUT lookup table (Look-up Table) M/M Mandatory/Mandatory PACS Medical Image Storage and Archive System (Picture Archiving and Communication System) RIS Radiology Information System SCP Service Provider (Service Class Provider) SCU Service Class User SH short string (Short String) SOP Service Object Pair UI Unique Identifier UID Unique Identifier U/M Optional/Mandatory U/U Optional/Optional VM Numerical Diversity (Value Multiplicity) VR numerical representation (Value Representation)

5.1 Logical properties of virtual print information interaction

The virtual print information interaction attribute table is shown in Table 1.

Table 1 Virtual Print Information Interaction Attribute Table

Attribute Name Tag (Tag) VR VM Type Check the instance UID (Study Instance UID) (0020,000D) UI 1 1

5.2 Virtual Print Information Interaction Process

The process of virtual printing SCP and SCU information exchange is a specific complete film printing process (see DICOM Standard.2011 Edition Chapter 2) Page 93), as shown in Figure 1, after the completion of the printing session, the service will receive the data content and the inspection information corresponding to the current printing.

Association matching (see Appendix A for a detailed example).

print

SCU

print

SCP

DICOM Film Session N-CREATE DICOM Presentation LUT N-CREATE DICOM Film Box
N-CREATE DICOM Image Box N-SET DICOM Film Box N-ACTION DICOM Film Session
N-ACTION DICOM Film Box N-DELETE DICOM Film Session N-DELETE Printer status
DICOM N-EVENT-REPORT

Figure 1 film printing flow chart

5.3.1 Process Matching Information

The SOP classes for the N-CREATE process in the film print session and the N-SET process for the DICOM image box are shown in Table 2.

Table 2 Basic Film Session Attribute Table

SOP class SOP class UID Basic Film Session SOP Class 1.2.840.10008.5.1.1.1 Basic grayscale image box SOP class 1.2.840.10008.5.1.1.4 in the N-CREATE communication process of the film session, the N-CREATE information that the service will receive is shown in Table 3.

Table 3 Basic Film Session Attribute Table

Property Name	Tag (Tag)	SCU/SCP	Check the instance UID (Study Instance UID) (0020, 0010)	U/U	Related Reference Check (0008,1110)	U/U	>Related SOP Class UID (0008, 1150)	M/M	>Related SOP Instance UID (Referenced SOP Instance UID) (0008, 1155)	M/M	Specified Character Set (0008,0005)	U/U	Number of Copies (2000,0010)	U/M	Print Priority (2000,0020)	U/M	Film Type (2000,0030)	U/M	Film Destination (2000,0040)	U/M	Film Session Label (2000,0050)	U/U	Memory Allocation (2000,0060)	U/U	Owner ID (2100, 0160)	U/U

Note 1: The M/M in the table indicates that the SCU supports the DIMSE service but does not require it to be used on an association. The SCP supports the DIMSE service.

Note 2: U/U in the table indicates that the SCU can support and use the DIMSE service, and the SCP can support the DIMSE service if the SCP does not support the SCU.

The DIMSE service used, which returns a failure status.

Note 3: U/M in the table indicates that the SCU can support and use the DIMSE service, and the SCP supports the DIMSE service.

In the N-SET communication flow of the image box, the N-SET information that the service will receive is shown in Table 4.

Table 4 Basic Gray Image Box N-SET Property Sheet

Property Name Tag (Tag) SCU/SCP Check the instance UID (Study Instance UID) (0020,000D) U/U Related Reading Sequence (0008, 1110) U/U >Related SOP Class UID (0008, 1150) M/M >Related SOP Instance UID (Referenced SOP Instance UID) (0008, 1155) M/M Image Box Position (2020,0010) M/M Basic Grayscale Image Sequence (2020, 0110) M/M >Samples Per Pixel (0028,0002) M/M >Photometric Interpretation (0028,0004) M/M >Rows (0028,0010) M/M >Columns (0028,0011) M/M >Pixel Aspect Ratio (0028,0034) MC/M Required when the ratio is not 1/1 >Bits Allocated (0028,0100) M/M >Memory Bit (Bits Stored) (0028,0101) M/M >High Bit (0028,0102) M/M >Pixel Representation (0028,0103) M/M >Pixel Data (7FE0,0010) M/M Polarity (2020,0020) U/M Magnification Type (2010,0060) U/U

Table 4 (continued)

Smoothing Type (2010,0080) U/U Min Density (2010, 0120) U/U Maximum Density (2010,0130) U/U Configuration Information (2010, 0150) U/U Requested Image Size (2020,0030) U/U Requested Decimate/Crop Behavior (2020,0040) U/U Related Expression LUT Sequence (Referenced Presentation LUT Sequence) (2050,0500) U/U >Related SOP Class UID (0008,1150) U/U >Related SOP Instance UID (0008, 1155) U/U

Note 1: The M/M in the table indicates that the SCU supports the DIMSE service but does not require it to be used on an association. The SCP supports the DIMSE service.

Note 2: U/U in the table indicates that the SCU can support and use the DIMSE service, and the SCP can support the DIMSE service; if the SCP does not support the SCU the DIMSE service used, which returns a failure status.

Note 3: U/M in the table indicates that the SCU can support and use the DIMSE service, and the SCP supports the DIMSE service.

5.4.1 Matching Method 1

The service detected an inspection instance in the N-CREATE process in the film printing session or the N-SET process in the DICOM image box.

UID (Study Instance UID) field for film matching (see Appendix B for an example of an application scenario).

- 1) Check the instance UID (Study Instance UID) as matching information;
- 2) Correlate the matching information with the patient information in the business system (such as the PACS system), and finally print the film with the patient.

Files are associated and stored.