HKCRRT

The Hong Kong College of Radiographers and Radiation Therapists

Standards of Practice for Medical Imaging Informatics

By

Medical Imaging Informatics Faculty

2022

First Version in 2022

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1 Brief information/background of medical imaging informatics

1.1 Medical Imaging Informatics (MII) is a developing sub-specialty under the Medical Imaging Profession. The field integrated knowledge of biological science, healthcare service management, information technology, medical physics, biomedical engineering and medical imaging science.

1.2 The specialists under this field are titled Medical Imaging Informaticists.

1.3 The core component of Medical Imaging Informatics is the Picture Archiving and Communication System (PACS) that manage all medical images generated in an imaging center. Medical images are stored digitally under Digital Imaging and Communication in Medicine (DICOM) standard. Medical Imaging Informaticists should possess the necessary knowledge to DICOM, PACS and the systems connected.

1.4 The specialty aimed basically at ensuring the medical images are properly displayed to users for making clinical decisions. Practically, knowledge on networking, computer hardware, application operation, information security, digital image processing, storage technology, data mining and artificial intelligence is required.

2 Safety and Precaution

2.1 Evaluate the possible risks and introduce necessary security measures before implementing a new operation related to the PACS network of the center for ensuring components connected to the network are protected from any forms of cyber-attacks.

2.2 Conduct regular audit and inspection on implemented operations in order to ensure the designed workflows are functioning normally regarding information security

2.3 Contingency plan for system down should be prepared for all users to follow so that essential service can be sustained from different scenarios of system faults.

3 Role & responsibilities of Radiographers

3.1 Radiographers/ Radiation Therapists as PACS operator

3.1.1 Ensure Data Integrity

3.1.1.1 Understand the functionality and workflow of RIS and PACS.

3.1.1.2 Avoid collecting inaccurate data.

3.1.1.3 Verify patient and study information for all operations.

3.1.1.4 Ensure all the images transmission to/ from PACS is successfully

completed.

3.1.2 Patient Data Privacy

3.1.2.1 Protect the privacy of patient data.

3.1.2.2 Keep all patient information confidential except when it is necessary to facilitate medical procedures of the patient, or when legally obliged.

3.1.2.3 All patient data shall be properly collected and for a purpose directly related to the clinical needs.

3.1.2.4 Practicable steps must be adopted to safeguard personal data from unauthorized or accidental access, processing, erasure loss or use.

3.1.2.5 De-identifying the study/ image for all assess of non-clinical purposes.

3.1.3 Patient identification

3.1.3.1 Correct patient identification is essential before applying any operations to images and/ or studies.

3.1.3.2 Use at least 2 different personal identifiers to verify patient's identity which may include patient's name, HKID number, date of birth, phone number or residential address.

3.1.3.3 For children, provision of birth certificate may be used to substitute the HKID card during patient identification procedure.

3.1.4 Information Security

3.1.4.1 To comply with all rules, regulations and guidelines laid down by department/ corporate/ government, in order to ensure all the information involved are properly protected from leakage.

3.1.4.2 To comply with all rules, regulations and guidelines laid down by department/ corporate/ government, in order to protect the system from possible attack from outside through network.

3.1.4.3 One must log in to the system with own credential; and one must log out the system once the operation is completed.

3.2 Roles of Medical Image Informaticist

3.2.1 A qualified Medical Imaging Informaticist is the healthcare professional equipped with knowledge on both health care and information science. One should possess a role to bridge up the application of information technology in clinical environment. A Medical Imaging Informaticist, on top of the role of

PACS operator, possesses additional roles and responsibilities.

3.2.2 Consultant on clinical aspects to IT professionals

3.2.2.1 Illustrate in detail the needs from clinical perspective in the development of system features.

3.2.2.2 Working with IT specialists, propose a system configuration of the installed system to facilitate a smooth clinical operation.

3.2.2.3 Estimate the scale of clinical activities to advise on the requirements on architecture, hardware, functionalities and resilience of a system.

3.2.3 Advisor on technological aspects to clinical users

3.2.3.1 Evaluate risks, limitations, feasibility on ideas/ workflows before implementation.

3.2.3.2 Prepare contingency plans for foreseeable failures of different components of the systems.

3.2.3.3 Introduce information technology, such as artificial intelligence, into existing clinical workflow to enhance clinical efficiency, accuracy and safety.

3.2.4 Coordinator for operations during system down

3.2.4.1 Trouble-shoot for possible causes of an observed system problem.

3.2.4.2 Summon the appropriate party to rectify the problem.

3.2.4.3 Exercise the contingency plan when system fault encountered.

3.2.4.4 Coordinate stakeholders to sustain the service with limited function before system resume normal.

3.2.4.5 Evaluate the incident and suggest possible precautions.

3.2.4.6 Incorporate the suggestions in a revised contingency plan or revised workflow.

3.2.5 Auditor and Quality Assurance

3.2.5.1 Monitor the image workflow is operating as designed. Keep track on all transactions and access to systems.

3.2.5.2 Trouble-shoot for all extraordinary behavior of the system to identify possible system fault or incorrect configurations.

3.2.6 Safeguard of rules and guidelines.

3.2.6.1 Uphold on rules, regulations and guidelines of unit/ center/ corporate/ government on information access and system connection/ operations.

3.2.6.2 Ensure all the operations are not violating any rules delineated.

3.2.7 Data Management

3.2.7.1 Ensure integrities of all medial images

3.2.7.2 Facilitate a smooth transfer of data from PACS to different medial systems.

3.2.7.3 Migrate existing data to new PACS and ensure the continuity of data access.

4 Requirements of Medical Imaging Informaticist

4.1 Academic qualifications

4.1.1 Undergraduate degree on Radiography, or equivalent; AND

4.1.2 Registered Radiographer in The Hong Kong Radiographers' Board with valid Annual Practising Certificate; AND

4.1.3 Postgraduate qualifications on

- Health Informatics, or
- Information Technology, or
- Medical Imaging, with subjects in informatics and information technology as major/ core, or
- Other academic qualifications recognized by HKCRRT (e.g. pass in Certificate Examination of HKCRRT in MII).

4.2 Practical experience

4.2.1 Two years working experience in the field of imaging informatics/ PACS administration; which minimum 8 weeks each year are deployed for PACS and/ or Informatics and/ or IT related tasks.

4.3 Collaboration

4.3.1 Medical Imaging Informaticists shall assume the responsibility of collaborating with staff on different ranks including administrators, other healthcare professionals, service/ system vendors, IT technologists and supporting staff in the delivery of service

4.4 Training and Education

4.4.1 To accommodate technology advancement and expansion of technology application, Medical Imaging Informaticists shall undergo continuous training and education via participating in relevant seminars and conferences. Practitioners shall accrue at least 45 CPD credits (min. CPD requirement from

Radiographers' Board) in a period of 3 years

4.4.2 Practitioners shall assume the responsibility of professional development to stay abreast of the cutting-edge information technology/ imaging science and share their knowledge and experience with others for upholding the standard of imaging informatics.

4.5 Research and Development

4.5.1 Practitioners shall assume the responsibility to actively participate in informatics related research studies for continuous development of the technology.

5 Declaration

The content of this SOP servers as a reference for radiographers and radiation therapists, or related professionals. It should not be the comprehensive guideline for related examination or procedure. The further elaboration of this document is subject to the decision of the Council of Hong Kong College of Radiographers and Radiation Therapists.

6 References

ACR-AAPM-SIIM Practice Parameters for Electronic Medical Information Privacy and Security 2019

ACR-AAPM-SIIM Technical Standard for Electronic Practice of Medical Imaging. 2017