

Appendix 2: Final Report QS7(ii)
Recommendations for Technical Standards for
Accreditation Requirements for Clinical Teleradiology

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1. Management and Infrastructure

1.1. *Practice Management*

The practice must have in place documented policies and procedures for the use of teleradiology. This document must, as a minimum, comply with the relevant legislative and legal requirements for the performance of medical imaging examinations.

1.1.1. Inter-Jurisdictional Reporting

All Medical Imaging Specialists involved in the supervision and reporting of examinations must maintain registration in the state or territory in which the examination takes place.

All Medical Imaging Specialists involved in the supervision and reporting of examinations must maintain all relevant insurances for the jurisdiction in which both the examination and interpretation takes place.

Practices must have contracts with Medical Imaging Specialists reporting from other jurisdictions, clearly defining the responsibility in all aspects of the examination.

The examination must be undertaken in a practice that fulfills the requirements of teleradiology standards. This practice must be able to independently verify compliance with the standards where they are providing reporting services internationally.

1.1.2. Report Identification/Provider Number Billing

The report must state the name of the reporting Medical Imaging Specialist.

The practice must have documented procedures to ensure that the billing of patients is in compliance with all legal requirements.

Where billing is provided under a provider number that is not allocated to the Medical Imaging Specialist providing the report, the practice must have procedures in place to ensure the items provided match the items billed.

1.2. Facilities

1.2.1. Reporting Environment

The reporting environment must be established to ensure optimal reporting conditions for the Medical Imaging Specialist.

The Medical Imaging Specialist must ensure conditions are suitable for image interpretation prior to reporting any examinations.

The reporting environment must ensure:

- i. The minimum amount of light reflection on the monitor where interpretation is being made.
- ii. Displays are placed ergonomically at reading level with centre of display slightly below eye level.
- iii. The displays must be placed away from areas that may cause image degradation such as magnetic fields and electronic transformers. (Samei E, AAPM TG18 Report, 2005).

1.3. Equipment

1.3.1. Workstations and Display

1.3.1.1. Workstation Characteristics Relative to Reporting Stations

The minimum system software functionality described in this standard must be available on all workstations performing image manipulation in order to provide the same quality image to the reporting Medical Imaging Specialist.

1.3.1.2. Minimum Specification of Function on Reporting Stations

Teleradiology equipment must maintain the following minimum functional features to ensure accurate interpretation of images for all modalities.

- Panning
- Image Magnification
- Rotation
- Window level and width adjustment
- Measurement
- Density Measurement
- Elements of Display
 - Matrix Size
 - Bit depth
 - Total number of images in study (ACR, 2005)

1.3.1.3. Monitor Resolution

Monitors for image interpretation must comply with the following table of minimum standards for the scope of examinations performed.

| Modality | Minimum Monitor Spatial Resolution |
|------------------|-----------------------------------------------------------|
| CR | 1600x1200 Monochrome or Colour |
| CT | 1024x768 Colour or Monochrome |
| US | 1024x768 Colour or Monochrome |
| Mammography | Minimum: 3MP Monochrome Recommendation: 5MP Monochrome |
| MRI | 1024x768 Colour or Monochrome |
| Nuclear Medicine | 1024x768 Colour or Monochrome |

1.3.1.4. Monitor Evaluation and Conformance

A practice shall ensure that monitors used in reporting of images for teleradiology or PACS have been assessed to ensure compliance with the characteristics in the following table.

| Characteristic |
|------------------------|
| Geometric Distortions |
| Display Reflection |
| Luminance Response |
| Luminance Dependencies |
| Display Resolution |
| Display Noise |
| Veiling Glare |
| Chromaticity |

As a minimum assessment the visual evaluation techniques must be performed as described by the ***AAPM Assessment of Display Performance for Medical Imaging Systems, 2005*** and comply with the standards set within that document

In addition to the above evaluation, the practice shall ensure that the monitors used for teleradiology or PACS comply with the following characteristics:

Brightness: at least 171cd/m² (ACR)

Contrast Resolution: at least 250:1 (ACPSEM)

Grey Scale: at least 10bit capable (24 bit colour) (ACPSEM)

Luminance transfer characteristic conform to the DICOM Part 14 Grayscale display function (GSDF). (ACPSEM, 2006)

Practices shall document conformance tests of display systems and maintain them for ongoing QA.

1.3.2. Quality Improvement and Quality Control

A practice utilizing teleradiology must have a QIS/QC program in place relevant to the scope of work provided.

The Quality control program must have documented procedures for monitoring and evaluating the effective management, safety and proper performance of acquisition, digitization, compression, transmission, archiving and retrieval functions, and backup and recovery of the system.

The QC system must also cover the environmental conditions under which reporting of teleradiology examinations is performed.

The QC program must include:

- i. Test images and clinical reference image availability
- ii. Service and maintenance records
- iii. Monitors and image display characteristics in accordance with the visual evaluation techniques as described by the **AAPM Assessment of Display Performance for Medical Imaging Systems, 2005**
- iv. Environmental conditions
- v. Quality control must include review of diagnostic image quality by the Medical Imaging Specialist.

Note: It is recommended that monitors have inbuilt auto-calibration and where this is not available that monitors are calibrated routinely by an appropriately trained person in accordance with a documented schedule. There are significant compliance issues in relation to this that must be considered when the final standards are set. The authors feel that this should be a recommendation to practices at this stage and not set as a standard. (ACPSEM, 2007)

2. Standards of Practice

2.1. Personnel

2.1.1. Qualifications

Medical Imaging Specialist

The Medical Imaging Specialist must be registered in the state or territory in which the examination takes place.

The medical imaging specialist must be registered in the state or territory in which the report is generated.

The Medical Imaging Specialist will maintain all relevant insurances for reporting in the state or territory in which the examination takes place.

The Medical Imaging Specialist will maintain all relevant insurances for reporting in the state or territory in which the report is generated.

Where teleradiology reporting is subcontracted, practices shall have contracts with Medical Imaging Specialists clearly defining the responsibility of all aspects of the examination.

Medical Imaging Team

The non-medical, imaging team must maintain all relevant registration and licenses in the jurisdiction in which the examination is performed.

2.1.2. Trainee Medical Imaging Specialist

Trainee Medical Imaging Specialists must only provide reports under the supervision of a qualified Medical Imaging Specialist.(RANZCR 2006)

2.1.3. Training in Teleradiology

The practice must ensure that all personnel providing any aspect of the teleradiology possess the professional qualifications according to their position and service and have undertaken appropriate training in the policies and procedures established for teleradiology.

There must be a documented training procedure for staff using teleradiology. The training must include all clinical and technically relevant aspects of teleradiology with documentation of the identity and qualifications of the trainer and the level of competence achieved following the training.

The procedure must include the limitations of the teleradiology system being used. (ACR, 2005)

2.2. Professional Supervision

The supervising Medical Imaging Specialist must be responsible for the conduct of the examination and must be qualified and certified for the scope of examinations performed by teleradiology. The supervision requirements for teleradiology must, as a minimum, comply with the general professional

supervision standards. A documented protocol relating to supervision for teleradiology examinations must be available.

2.2.1. Delegation of Tasks under Professional Supervision

Some aspects of teleradiology involve the delegation of tasks from the medical imaging specialist to technical and administrative staff. Delegation must be performed under a documented framework developed and implemented by the practice with reference to the following details.

2.2.1.1. Personal Attendance

Where a particular procedure has been determined that personal attendance by the medical imaging specialist is required, the practice must have a policy in place to ensure the examination is performed at a location where personal attendance by a medical imaging specialist is available.

2.2.1.2. Direct Supervision

Where a particular procedure has been determined that personal attendance by the medical imaging specialist is not required but direct face to face supervision of other members of the imaging team is required, the practice must have a policy in place to ensure the examination is performed in a location where this direct face to face supervision is available.

2.2.1.3. Indirect Supervision

Where it has been determined that a particular procedure can be performed in accordance with appropriate written protocols under the direction of a Medical Imaging Specialist, the protocols must be clearly written and readily available at the site at which the examination takes place. These protocols must include triggers for the medical imaging team to identify the need for direct involvement of the medical imaging specialist.

2.2.2. Professional Competence

The practice must determine the professional competence of all members of the imaging team undertaking examinations in teleradiology in accordance with **2.1 Personnel**.

2.2.3. Imaging Requests

The practice must have a policy for the review of imaging requests including appropriateness of the examination. Consideration must be given to delegation of this task under section 2.2.1.

2.2.4. Performance of the Imaging Examination

The Medical Imaging Specialist is responsible for the conduct of the examination and must ensure that the examination is undertaken under appropriate supervision of all aspects of the examination.

2.2.5. Interpretation and Reporting

The Medical Imaging Specialist must ensure that the quality of interpretations and reporting are not adversely affected by the use of teleradiology.

2.2.6. Clinical Liaison Between Referrer and Medical Imaging Specialist

The Practice must ensure lines of communication between referrer and Medical Imaging Specialist is available for a patient whose imaging report is being produced by teleradiology.

The medical imaging specialist must have access to the referring practitioners contact details in order to facilitate this communication.

The send and receive sites must have access to rosters to ensure any contact by the referring practitioner can be referred directly to the supervising radiologist.

2.2.7. Clinical Liaison between the Medical Imaging Technologists and Medical Imaging Specialist

The practice must ensure there is appropriate clinical liaison between the Medical Imaging Technologist and Medical Imaging Specialist during all stages of the examination.

The Medical Imaging Specialist must be available for immediate contact both prior to and after the examination. The Medical Imaging

Specialist must be available to alter the conduct of the examination should it be required.

The send and receive sites must have access to rosters and personnel directories to ensure any contact required by the Medical Imaging Technologist can be referred directly to the supervising Medical Imaging Specialist.

2.2.8. Preliminary and Final Interpretations

All interpretations of images, regardless of whether they are preliminary or final, must be performed on systems that meet the technical specifications determined in this standard.

2.2.9. Examination Protocols

Clinical protocols must be clear, available and reviewed by the supervising Medical Imaging Specialist for the scope of examinations performed at the site of acquisition. Where reporting is contracted there must be a policy that clearly states that the contracted Medical Imaging Specialist is responsible for the protocol of examinations.

2.3. Safety

2.3.1. Contrast Administration

Where contrast media is required for any examination the Medical Imaging Specialist shall inform the Medical Imaging Technologist who will arrange for a medical practitioner to supervise the administration of the contrast media.

2.3.2. Data storage and transmission

The practice must maintain the integrity of data during storage and transmission including the use of firewalls.

Data in transmission across a WAN must maintain a minimum of 128bit encryption.

Data stored must be protected by at least a username and password.

2.3.3. Redundancy and Back Up

Where electronic data for teleradiology/PACS is required to be kept for any period following reporting, backup and recovery processes must be in place.

Back up processes must be documented and performed such that there is no loss of data from the original data set.

Recovery processes must be documented and ensure no loss of data quality. The practice must perform a test on data recovery at least annually as part of its quality program.

2.4. *Patient Management*

2.4.1. Patient Consent

A patient must be aware that teleradiology may be used in the course of the examination being completed.

Consent may be obtained directly from the patient or the practice shall have clear signage indicating the use of teleradiology.

2.4.2. Patient Confidentiality

The practice must have a privacy policy that includes teleradiology. The privacy policy must make reference to the national Privacy Act and the Ten Privacy Principles.

The practice must ensure that patient confidentiality is maintained in accordance with all relevant legislation in this matter.

2.5. *Teleradiology/PACS*

2.5.1. Protocols for the Transmission and Display of Images

Protocols for transmission of imaging data must be available at the transmitting and receiving sites appropriate to the scope of

examinations being performed including access previous studies where available.

The protocols must be clear for each examination type being performed. The protocol must include references to the following:

- i. The examination
- ii. Acquisition method including resolution
- iii. Compression type and level for each examination
- iv. Image orientation
- v. Image sequence selection
- vi. Urgency of Examination
- vii. Transmission time
- viii. The number of images in the series
- ix. Previous studies where available

2.5.2. Method of Acquisition

Acquisition of teleradiology images must be made using DICOM format on modalities where this is available.

Practices that do not currently have DICOM compliant equipment on modalities must use DICOM acquisition format by 1 January 2012.

2.5.3. Identification of Data

Patient data must be identifiable and contain the following information:

- i. Full name
- ii. Unique Identifier
- iii. Date and time of examination
- iv. Facility name
- v. Type of examination
- vi. Compression type and level
- vii. Patient notes
- viii. Annotations including side markers

2.5.4. Compression

Primary diagnosis must only be performed on images where there is no reduction in diagnostic image quality. Compression levels must be selected according to practice quality requirements based on test pattern analysis and subject to ongoing review by the Medical Imaging Specialist. (ACR 2005)