



## Position on Teleradiology

**Version:** November 2001  
**Approved by:** Council  
**Date of approval:** November 2001

### 1. INTRODUCTION

Teleradiology can be defined as the electronic transmission of radiological images in digital form from one location to another using a data communication link provided by a third party carrier(s). This usually implies sending images from a primary acquisition site to a secondary location where they are interpreted for the purpose of either official diagnosis or consultation.

This is a relatively new technology and is undergoing rapid change and development in line with the general advances in digital imaging and communications technology.

This position is being developed by the RANZCR based on current technology and clinical application of teleradiology, but will be subject to periodic revision in the light of future developments.

### 2. USE OF TELERADIOLOGY

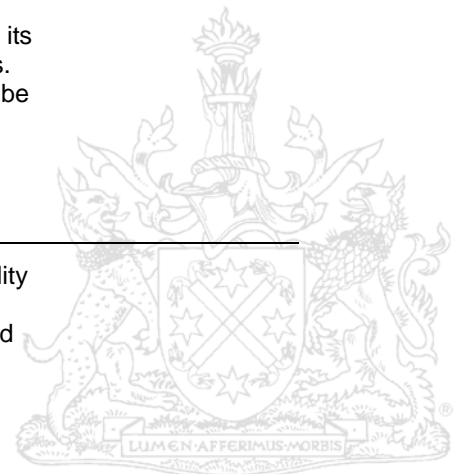
Demographically, Australia and New Zealand are well suited to the application of teleradiology. Relatively small, widely separated population centres, which cannot support the presence of a full-time diagnostic imaging specialist, can access specialist diagnostic services by the appropriate use of teleradiology. This has the potential to significantly improve patient care in many communities, by virtue of immediate specialist reporting of imaging examinations, coupled with professional supervision which is possible from the off-site radiologist.

Other relevant applications of teleradiology include the interpretation of emergency studies in on-call situations, and access to additional opinions by external consultation. All of the above can have a positive impact on the overall quality and efficiency of diagnostic imaging practice whether this be in the public or private sector.

As this is an evolving technology, new applications will emerge in future including its use as a means of conveying diagnostic images and reports to referring clinicians. A reasonable contingency plan to cope with technical transmission failure should be formulated in each centre utilising Teleradiology.

### 3. QUALITY ASSURANCE

Radiologists who utilise teleradiology in their practices should assume responsibility for ensuring the introduction of and adherence to appropriate quality standards at both the transmitting and receiving sites. Quality standards and procedures should encompass technical personnel and all equipment used in the teleradiology process.



3.1 Imaging Technologist: All technologists producing images for teleradiology transmission should hold appropriate qualifications and should be trained in the proper operation of the teleradiology scanning and transmitting equipment. The technologist should at all times regard himself or herself to be under the professional supervision of the interpreting radiologist who assumes ultimate responsibility for the diagnostic examination and patient safety.

3.2 Radiologist: Radiologists interpreting transmitted images should regard himself or herself as personally responsible for the conduct and quality of the examination, and should assume a supervisory role despite the off-site location.

The radiologist should also understand the basic technology of teleradiology, and in particular its potential limitations, and should not issue official diagnostic reports unless the equipment specifications of the teleradiology system meet the minimum standards contained herein.

He or she should also be familiar with the practical aspects of workstation monitor reporting, and be able to utilise the image manipulation facilities available in order to maximise the diagnostic accuracy of image interpretation.

3.3 Professional Supervision: Radiologists using teleradiology for official diagnostic reporting should ensure that the level of professional supervision should be no less than that of conventional practice.

3.4 Teleradiology Equipment: Equipment used in teleradiology systems must ensure that when the technology is used for primary interpretation or consultation, there should be no critical loss in image resolution from acquisition to final display. This involves the adherence to a set of minimum specifications as outlined below.

a. Small-Matrix Systems: This refers to CT, MRI, ultrasound and nuclear medicine imaging. There should be no loss of image quality between acquisition and display. Teleradiology systems used for these modalities require at least 0.5K x 0.5K spatial resolution and at least 8-bit contrast depth at both acquisition site and diagnostic workstation.

b. Large-Matrix Systems: This refers particularly to digitised radiographs, and also embraces computed radiography. At present, is not appropriate to digitise and transmit mammograms for diagnostic reporting.

\* Digitisation System: This should utilise a laser or CCD (Chargecoupled device) scanner capable of scanning in at least 2K spatial resolution and 8-bit contrast depth. They should also deliver an even grey scale depth throughout the optical density range of the transmitted image up to an optical density of at least 3.0

\* Diagnostic Workstation: These should incorporate a monitor of acceptable quality monitor capable of displaying a minimum of 8-bit gray scale with a spatial resolution of 1K x 1K or better.

3.5 Image Compression: If compression is utilised, it should result in minimal loss of image quality.

3.6 Teleradiology reporting environment

The reporting environment should be optimised to avoid screen glare and extraneous light and in general should be no less optimal compared to film reporting areas.

## **4. IMAGE AND DATA MANAGEMENT**

---

Teleradiology systems should incorporate image management protocols which ensure security and confidentiality of patient data, and which maximise the diagnostic accuracy of image interpretation.

4.1 Transmitting site: Individual patient data should include patient name, date and time of radiological examination, location of origin of examination, type of examination, brief clinical history, whether compression is utilised, details of responsible clinician number of images acquired; identification of technologist acquiring images; intended destination of transmitted images; time of transmission; All this information must be available to the reporting radiologist. Logs of images transmitted should be available.

4.2 Reporting workstation: Display stations should employ software systems, which allow the following functions –

- \* Interactive contrast and brightness adjustment when viewing 8 bit images or full window and level adjustment when utilising 12 bit DICOM images.
- \* Image magnification;
- \* Gray scale inversion;
- \* Angle measurements;
- \* Annotation;
- \* Rotating and flipping the displayed images; and
- \* Measurement
- \* Patient identification always displayable on screen.

## **5. ACCREDITATION ISSUES**

---

It is recognised that the RANZCR is moving towards the development of quality assurance and accreditation guidelines for diagnostic imaging practices. It is anticipated that this process will embrace all facets of imaging practice including CME for imaging specialists, credentialing of imaging technologists where appropriate, and the establishment of minimum standards for plant and equipment used to perform imaging studies.

Where utilised, teleradiology should also be subject to the accreditation and quality assurance process by the application of the minimum standards and recommendations contained within this document.

## **6. PROVIDER LICENSING AND LIABILITY**

---

These issues should be addressed by radiologists who practice teleradiology, where the transmitting and receiving sites are across state or national boundaries.

6.1 Licensing: The RANZCR recommends that any radiologist practicing teleradiology should be appropriately licensed in the jurisdiction of both the transmitting and receiving sites.

6.2 Liability: Practitioners providing teleradiology services are advised to carry malpractice insurance coverage which embraces both the transmitting and receiving sites as if he or she is physically practising at both locations.

## **7. ONGOING REVIEW**

---

The RANZCR has established a Teleradiology Committee responsible to the Council of the College, and with membership drawn from all States and Territories of the Commonwealth and from New Zealand.

The College recognises this as an expert Committee to advise the College, its Fellows and Government on appropriate standards of teleradiology practice, and to monitor future development of this and related image management technologies. The Committee will review the RANZCR position on a regular basis at least annually in the light of such developments, and will report to College Council accordingly.

## **8. ACKNOWLEDGMENT**

---

The RANZCR acknowledges the assistance afforded by the American College of Radiology which gave its permission for the ACR Standard on Teleradiology to be used by our College as a basis for the development of this document.