Code of Practice for Diagnostic Imaging Services

Provision of Digital Diagnostic Images

September 2009

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Purpose

The overarching aim of the Code of Practice for Diagnostic Imaging – Provision of Digital Diagnostic Images (Code of Practice) is to achieve best practice through self-regulation and consultation with key stakeholders. Key stakeholders include:

- Patients;
- Referrers and Clinicians;
- State and Commonwealth Governments, particularly the Department of Health and Ageing;
- Diagnostic Imaging Providers (Public and Private sectors);
- Vendors (Health information technology and diagnostic device / equipment vendors);
- National e Health Transition Authority(NEHTA);
- Royal Australian and New Zealand College of Radiologists (RANZCR);
- Australian Diagnostic Imaging Association (ADIA); and
- Royal Australasian College of Surgeons (RACS) via its sponsorship of the multidisciplinary Digital Imaging Working Party (DIRWP).

The guidelines aim to improve accessibility of digital diagnostic imaging images and examination data during the transition of radiology and healthcare to a fully digital environment.

Acknowledgments

Preparation of this Code of Practice builds on documents provided by the following parties:

- Royal Australian and New Zealand College of Radiologists (RANZCR)
- RANZCR Quality Use of Diagnostic Imaging Program (QUDI Program)
- MacIsaac Informatics – Dr Peter MacIsaac, Bernard Crowe and Paul Clarke
- RACS Consensus Statement (www.surgeons.org/dirwp)

In particular related documents produced by Dr Peter MacIsaac and associates through the RANZCR QUDI project have been instrumental in the formulation of this Code and should be referenced for further and more in depth information.

Glossary of Abbreviation and Acronyms

ADIA	Australian Diagnostic Imaging Association
IHE	Integrating the Healthcare Enterprise
RANZCR	Royal Australian and New Zealand College of Radiologists
MBS	Medicare Benefits Schedule
RACS	Royal Australasian College of Surgeons
DIRWP	Digital Imaging RACS Working Party

Definitions

The following definitions are applicable to this document only and should not be used for explanation of the same or similar terminology elsewhere.

Connectathon	An annual event held by Integrating the Healthcare Enterprise (IHE) where participating vendors test their implementation of IHE capabilities with other vendors in a supervised environment[1].
Clinically Relevant	A clinically relevant service is a service that is generally accepted in the profession as being necessary for the appropriate treatment of the patient[5].
Diagnostic quality image	An image that is comparable in quality and presentation to that used by radiologists in reporting.
Diagnostic quality image set	A set of images that are comparable in quality and presentation to that used by radiologists in reporting.
Lossy images	Compressed images with a reduced file size and resolution. The amount of resolution loss or visual artefacting is the result of the compression algorithm used and is irreversible.
Lossless images	Compressed or non-compressed images. Compressed images have reduced file size but no loss of resolution (file quality). The file size reduction is less than that of Lossy compression techniques.
Messaging	Electronic transfer of data including textual reports.
Non-diagnostic images	Images not useable for radiology reporting due to compression, image degradation, post processing, reconstruction or format.
Non-diagnostic image sets	Full or representative image sets not useable for radiology reporting due to image quality or content such as being representative images only.
Portable Media	Media used for the presentation of soft copy digital images. Examples include CDs, flash cards.
Representative images / Representative image sets: (also known as illustrative image sets /key images)	Image sets used to illustrate key findings, diagnosis and radiologist report content. Individual images can be of diagnostic or non-diagnostic quality. Regardless of image quality the omission of images from the set means a full set of images in not presented. Such illustrative image sets can be useful adjuncts to full image set presentations to support a more user-friendly interface. Examples include cross sectional studies and image reconstructions at conventional thickness in multi-planar modalities.

Executive Summary

The Code of Practice outlines key guidelines and recommendations for image delivery throughout the transition period from conventional film delivery to a fully digital environment. The applicable timeframe is yet to be agreed upon by all key stakeholders.

Both referrers and providers are encouraged to communicate their respective needs and capabilities in a collaborative fashion prior to the institution of a professional relationship with patient welfare the prime consideration.

Patient Rights

The transition to digital environment should not adversely impact patients' rights of access to or the quality of care provided.

Referrer Rights

A referrer or subsequent treating medical doctor is entitled to request and receive (or access) the presentation of images in a format suitable to the clinical pathway and technological infrastructure of those involved in the immediate management of the prevailing condition.

Secondary or duplicate image sets required in a format other than that used for the initial delivery can be requested from imaging providers by referrers and subsequent treating physicians, where access to such images will contribute directly to patient management and treatment.

Referrer Obligations

If not already in place, referrers and subsequent treating physicians should be planning and installing the necessary IT infrastructure to be able to access, view and, if necessary, manipulate and store digital images. This is especially important for volumetric studies such as CT and MRI where the number of images make clinical interpretation through viewing these images on computer monitor more satisfactory.

Referrers should make their preferred media and imaging requirements known to providers before requests are delivered. However, it is important that referrers have realistic expectations in requesting "film" in all cases. Multislice CT studies often create over 1,000 images per patient study, and an element of selection must be applied judiciously when key images are filmed. When selected images are supplied on film (or other hard copy) they must be appropriate to the clinical setting.

Public and Private Hospital Obligations

If not already in place, hospital operators should also be planning and installing necessary IT infrastructure to be able to access, view and if necessary, manipulate and store digital images in wards, operating theatres, emergency departments and other areas as clinically appropriate.

In order to minimise unnecessary duplication of imaging procedures and to ensure optimal patient care, hospitals/institutions shall not unduly restrain the web access of referrers/treating doctors to view images and reports from external providers.

Imaging Provider Rights

Having taken into account the referrers preferred media and imaging requirements, imaging providers have the right to nominate their default delivery media on the basis of their professional opinion, policies, infrastructure, the examination and imaging set characteristics.

Imaging Provider Obligations

Providers should seek to deliver or provide access to media and imaging sets in the format requested by the referrer provided these requests are reasonable for the referrer's clinical needs

The provider should work with the referrer, or Public and Private Hospital operator to develop solutions in each setting, and to facilitate the transition to digital imaging in accordance with the referrer's, or Public and Private Hospital operator's rights and obligations as set out in this document.

Delivery Media Selection

Where an imaging provider has nominated on-line web delivery or portable digital media (must be IHE compliant) as the default delivery method, then hard copy should still be available on request as a delivery option.

Guidelines should be used in determining default delivery media by diagnostic imaging providers where media has not already been nominated by the referrer or agreed upon after consultation with the referrer:

- The reason for referral or immediate intended use of images (refer 3.8.1 and 3.8.2);
- The clinical management pathway for the presenting condition/symptoms, requested examination or diagnosed condition (refer 3.8.3). This may require consultation with the referrer; and
- The image set characteristics (refer 3.8.4).

Image Quality

The Code of Practice for the provision of diagnostic images does not encompass quality review of imaging protocols or source images.

The chosen delivery media and image set presentation should not compromise overall image quality.

Minimum Standards

Mandatory criteria stipulated by Medicare Australia, RANZCR and other governing bodies remain applicable, regardless of the delivery media utilised.

Imaging Referrers and providers are referred to www.raanzcr.edu.au/digitalimaging/index/cfm and www.ihe.net.au for governing principles.

Providers should ensure that a high standard of text reporting is maintained at all times.

For imaging providers having made the transition to digital imaging, a minimum storage period of six (6) months is applicable.

Compliance with TGA legislation where applicable.

Governance and Compliance

In keeping with the premise of industry based self-regulation, governance will ultimately be the responsibility of industry bodies. Medical specialists, craft groups and the Government will be consulted on issues around conformance and proposed amendments.

Provision of Digital Diagnostic Images

1. Overview

With the advent of digital technology, the radiology industry has embraced its newfound capacity to capture, deliver and store diagnostic images with efficacy.

Digital imaging technology is now rapidly being introduced in diagnostic imaging practices of both the public and private sector.

The migration to digital imaging and electronic delivery systems holds substantial benefits for patients, referring practitioners and diagnostic imaging practices. These benefits cannot be realised until all those affected are willing and able to adapt to and accept the changes necessary to achieve optimal results for patients requiring radiological investigation.

The current dissatisfaction voiced by some craft groups to ADIA is based on the quality of images received and their mode of delivery. In addressing these issues ADIA has undertaken investigations into the prevailing practices of its members and the potential for improvement. In doing so, ADIA have noted that referrer groups dissatisfaction has stemmed from the lack of a consultative approach by all key stakeholders, apart from patients, across the healthcare industry.

To address the reported concerns of referrers and treating physicians feeling disenfranchised with current practices of some diagnostic imaging providers, the following guidelines have been developed.

2. Patient Rights

The transition to digital environment should not adversely impact patients' rights of access to or the quality of care provided.

3. Image Sets and Media Selection

3.1 Existing Practices

Diagnostic Imaging examinations must result in an imaging specialist validated report and the provision of, or access to, diagnostic images as deemed appropriate by the diagnostic imaging provider or as mutually agreed between diagnostic imaging provider and the referrer. Delivery media considered appropriate may include:

- On-line Web-based server access;
- IHE compliant Portable media; and
- Hard copy (e.g. film, print on high quality paper and, for orthopedic templating, life size film is the appropriate hard copy).

3.2 Transition Period

The transition to a fully digital environment must be managed to ensure that key stakeholders have the opportunity to adapt and there is no adverse impact on patient healthcare or unreasonable inconvenience to health professionals. The diagnostic imaging community concedes a gradual progression is necessary and has developed the Code of Practice as a minimum standard of conduct during the period of time taken to fully migrate to the digital environment (the "transition period").

The Code of Practice outlines key guidelines pertaining to the transition period.

To that end both referrer and imaging providers' rights and obligations contained herewith are to be reviewed from time to time during the transition period.

3.3 Referrer Rights

3.3.1 A referrer or subsequent treating medical doctor is entitled to request and receive (or access) the presentation of images in a format suitable to the clinical pathway and technological infrastructure of those involved in the immediate management of the prevailing condition.

3.3.2 Secondary or duplicate image sets required in a format other than that used for the initial delivery can be requested from imaging providers by referrers and subsequent treating physicians, where access to such images will contribute directly to patient management and treatment. The provider may charge the patient an additional fee for this service. If, due to storage processes or other unforeseen circumstances, identical images or data sets are not available, or the preferred media is unsuitable, an alternative workable media should be agreed upon following consultation.

3.3.3 Should the parties fail to agree on the delivery media or the diagnostic imaging provider is in breach of these guidelines, referrers can report the incident in writing in accordance with the Issues Resolution Process, refer Section 6.3.

3.3.4 Delivery media or image sets that are deemed to be non-compliant with the Code of Practice can be refused. In these circumstances a compliant image set or alternative media can be requested and the incident can be reported in writing in accordance with the Issues Resolution Process, refer Section 6.3.

3.4 Referrer Obligations

3.4.1 Referrers should make their preferred media and imaging requirements known to providers before requests are delivered. However, it is important that referrers have realistic expectations in requesting "film" in all cases. Multislice CT studies often create over 1,000 images per patient study, and an element of selection must be applied judiciously when key images are filmed. When selected images are supplied on film (or other hard copy) they must be appropriate to the clinical setting.

3.4.2 Referrers should document relevant clinical information in a clear and concise fashion on the request form highlighting the clinical need for the request.

3.4.3 Where on-referral or an unforeseen change in treating physician means the original presentation of images is no longer compatible with a medical practitioner's needs,

the medical practitioner should inform the diagnostic imaging provider of the new image set requirements.

3.4.4 If not already in place, referrers and subsequent treating physicians should be planning and installing the necessary IT infrastructure to be able to access, view and, if necessary, manipulate and store digital images. This is especially important for volumetric studies such as CT and MRI where the number of images make clinical interpretation through viewing these images on the computer monitor more satisfactory.

3.4.5 Repeat referrals should be where clinically relevant only. Referrals for examinations due to "unsuitable image format" should not be requested without consultation with the provider and articulation of the clinical need for a repeat study. Otherwise the referral will be deemed to be an inappropriate use of diagnostic imaging.

3.5 Public and Private Hospital Obligations

3.5.1 If not already in place, hospital operators should also be planning and installing necessary IT infrastructure to be able to access, view and if necessary, manipulate and store digital images in wards, operating theatres, emergency departments and other areas as clinically appropriate.

3.5.2 In order to minimise unnecessary duplication of imaging procedures and to ensure optimal patient care, hospitals/institutions shall not unduly restrain the web access of referrers/treating doctors to view images and reports from external providers.

3.6 Imaging Provider Rights

3.6.1 Having taken into account the referrers preferred media and imaging requirements, imaging providers have the right to nominate their default delivery media on the basis of their professional opinion, policies, infrastructure, the examination and imaging set characteristics.

3.6.2 Following consultation with the referrer, imaging specialists have the right to exclude images from the end products of examinations in cases where both deem there is no clinical relevance for their inclusion.

3.6.3 Referrals for examinations due to "unsuitable image format" should not be accommodated given that they are deemed to be an inappropriate use of diagnostic imaging.

3.6.4 Where secondary or duplicate image sets are required in a format, other than that used for the initial delivery, best endeavours should be made to provide identical images on the requested secondary media. If identical images or data sets are not available, or if the preferred media is unsuitable, an alternative workable media can be provided following consultation. If the inability to provide identical images is due to the provider not conforming to Code guidelines the referrer can report the incident in writing in accordance with the Issues Resolution Process, refer Section 6.3.

3.6.5 Imaging providers may elect to charge additional fees for the provision of duplicate image sets (using the same or alternative delivery media).

3.7 Imaging Provider Obligations

Providers should seek to deliver or provide access to media and imaging sets in the format requested by the referrer provided these requests are reasonable for the referrer's clinical needs.

Where there is an inability to deliver the referrer's preferred media or images, an alternative workable deliverable can be provided, following consultation.

Where duplicate image sets or images are requested, imaging providers will use reasonable endeavours to fulfill these requests.

The provider should work with the referrer, or Public and Private Hospital operator to develop solutions in each setting, and to facilitate the transition to digital imaging in accordance with the referrer's, or Public and Private Hospital operator's rights and obligations as set out in this document.

3.8 Delivery Media Selection

Where an imaging provider has nominated on-line web delivery or portable digital media (must be IHE compliant) as the default delivery method, then hard copy should still be available on request as a delivery option.

Additional fees may be levied by the provider when hard copy is requested.

In all cases in the sections below, portable media must be IHE compliant.

The below guidelines should be used in determining default delivery media by diagnostic imaging providers where media has not already been nominated by the referrer or agreed upon after consultation with the referrer:

- The reason for referral or immediate intended use of images (refer 3.8.1 and 3.8.2);
- The clinical management pathway for the presenting condition/symptoms, requested examination or diagnosed condition (refer 3.8.3). This may require consultation with the referrer; and
- The image set characteristics (refer 3.8.4).

3.8.1 Referrer Classification

For the purpose of selecting the most appropriate media for the distribution of primary digital image sets, referrer requirement classifications are:

1. Images are not required by the referring practitioner. Images are not reviewed but rather it is the radiologist report that is relied upon for determining on-going patient management.
2. Images are required by the referring practitioner for viewing purposes only. The radiologist report is relied upon for determining the on-going patient management and the images are used to illustrate the report.
3. Images are required for review, diagnosis, treatment planning, reporting and if applicable manipulation.

	Referrer Classification 1	Referrer Classification 2	Referrer Classification 3
Appropriate Delivery Media	Web PACS access Portable media Film Non - thermal paper	Web PACS access Portable media Film Non - thermal paper	Web PACS access Portable media Film
Preferred Delivery Media	Web PACS access Portable media	Web PACS access Portable media	Web PACS access Portable media Film (on request)
Minimum Digital Image Quality	Lossy images	Lossy images	Lossless images Full data sets
Minimum Image Sets	Representative images or nil where web access is available	Representative Images or nil where web access is available and the referrer has not requested film	Full image set of acquisition data specifications

3.8.2 Intended Use

For the purpose of selecting the most appropriate media for the distribution of primary digital image sets intended use classifications are:

1. Images are used for diagnosis and/or treatment or planning where dimensions are essential.
2. Images are used for diagnosis only.
3. Examinations are requested to fulfill routine pre and post treatment requirements, including but not limited to, pre and post-operative examinations such as chest x-rays.
4. Examinations requested are procedural in nature including but not limited to biopsy and facet joint injections.

	Intended Use Type 1	Intended Use Type 2	Intended Use Type 3	Intended Use Type 4
Appropriate Delivery Media	Web PACS access Portable media Film	Web PACS access Portable media Film Non - thermal paper	Web PACS access Portable media Film Non - thermal paper	Web PACS access Portable media Film Non - thermal paper
Image Set Inclusions	True size hard copy images or calibrated CR images or calibrated DR images or non true size images including a scale measure	Images to include scale measure	Images to include scale measure	Images to include scale measure

3.8.3 Patient Clinical Pathway

Where the Imaging Provider believes that the diagnostic imaging results will likely be used by a subsequent treating physician, then the Imaging provider will select the appropriate media for distribution of results to the referrer:

1. No on-referral anticipated: Episode closed. Present imaging result in form requested by referrer.
2. On-referral anticipated: Present imaging result in the form mostly likely requested by the subsequent treating physician as images are likely to be integral to secondary diagnosis, treatment planning, and reporting.

	Pathway Type 1	Pathway Type 2
Recommended Digital Image set provided	As requested by referrer	Subsequent treating physician requirements as anticipated by imaging provider

3.8.4 Image Set Characteristics

For the purpose of selecting appropriate media for the distribution of primary digital image sets image set characteristics classifications are:

1. Simple and/or low volume image sets - examples include, but are not limited to, general x-ray; mammography and ultrasound.
2. Complex and/or high volume image sets – examples include, but are not limited to, Multi–Slice CT; MRI.
3. High volume post processed image sets – examples include, but are not limited to, post processed Multi-Slice CT; MRI.
4. Complex and/or high volume image data – examples include, but are not limited to, cardiac CT; functional MRI; spectroscopy.

	Image Set Type 1	Image Set Type 2	Image Set Type 3	Image Set Type 4
Appropriate Delivery Media	Web PACS access Portable media Film, Non - thermal paper	Web PACS access Portable media	Web PACS access Portable media	Web PACS access Portable media

Appropriate delivery media outlined above should be selected after consideration of the referrer type and intended use. The remaining options should assess image set suitability. Suitability of the delivery media will vary based on image set specifications, such as compression algorithms used, and volume of images included in the delivery.

In cases where the clinical management pathway is ascertained, it is recommended that the diagnostic imaging provider align the delivery method to the highest common denominator. Other key practitioners should be considered prior to delivery.

4. Image Quality

4.1 The Code of Practice for the provision of diagnostic images does not encompass quality review of imaging protocols or source images. Any image quality review will assess factors causing possible artifact and image degradation in the provision of digital images, such as the selected compression algorithm/factor and magnification factors

4.2 The chosen delivery media and image set presentation should not compromise overall image quality. Acceptable minimum image quality standards for each media and presentation are expected to vary, but for all images there should be no loss of clinically significant diagnostic image quality [2] or data.

4.3 Acceptable image quality will be achieved through conformance to adopted minimum standards. Refer Section 5.

4.4 Images noted as 'not being of diagnostic quality' are inappropriate for further radiological review or diagnosis. Images labeled as such do not represent images of low quality. This labeling usually pertains to lossy images or representative rather than full image sets.

	Film	Digital
Diagnostic Image Quality Definition	100% scale images with sufficient images to cover the intent of the request	Full DICOM dataset should be provided

5. Minimum Standards

5.1 Overarching Principles and Obligations

5.1.1 Mandatory criteria stipulated by the HIC, RANZCR and other governing bodies remain applicable, regardless of the delivery media utilised.

5.1.2 Conformance by all key stakeholders is imperative in achieving the ultimate aim of optimal patient care and equal access to quality diagnostic imaging services for both public and private patients.

5.1.3 Standard practices used must ensure reliability, integrity and confidentiality of the deliverables.

5.1.4 In order to view reports and diagnostic images electronically, particularly after the cessation of the agreed transition period, referrers, treating physicians and host institutions will be required to have access to IT infrastructure and services of specifications suitable for the viewing and interpretation of diagnostic imaging.

5.1.5 Diagnostic imaging providers will work collaboratively with key stakeholders to facilitate the required migration to the digital environment. Through consultation and an understanding of clinician requirements technical guidance will be provided wherever possible.

5.1.6 Referrers and providers will regularly acquaint themselves with changes from time to time in:

a) Applicable standards;
b) Specifications and documentation (IHE and DICOM conformance statements) for confirming equipment;
c) Software recommendations;
d) Levels of interoperability (IHE Connectathon results);
e) Advisement on developments for both IT and industry advances;
f) Advisory group contacts.

5.2 Image Delivery and Media

Imaging Referrers and providers are referred to www.raanzcr.edu.au/digitalimaging/index/cfm and www.ihe.net.au for governing principles for:

- Packaging and labeling of deliverables;
- Portable Delivery Media specifications and content: including security, instruction files and in-built viewers, and
- Images specifications for each media approved for use

5.3 Reports

At all times providers should ensure that a high standard of text reporting is maintained with appropriate attention to:-

- Report content;
- Report structure;
- Electronic report transmission;
- Archiving and retrieval; and
- Integration with electronic records.

5.4 Storage

5.2.1 For imaging providers having made the transition to digital imaging, a minimum storage period of six (6) months is applicable. Significantly longer periods are envisaged in many clinical settings.

5.2.2 It is recognised that with current technology it is not practical to store the full diagnostic imaging sets for large volumetric studies.

5.2.3 Stored images or data sets must be representative of key findings and facilitate review within the mandatory storage period.

6. Governance and Compliance

6.1 Governance

In keeping with the premise of industry based self-regulation, governance will ultimately be the responsibility of industry bodies. Medical specialists, craft groups and the Government will be consulted on issues around conformance and proposed amendments.

6.2 Development

The ADIA Informatics Committee will regularly review and recommend changes to the Code of Practice throughout the transition period.

A committee will be formed to coordinate any further development of the Code of Practice on an as needs basis.

6.3 Issues Resolution Process

Most issues, particularly those regarding delivery of and access to clinically relevant images to the referrer, are to be resolved at the local level via discussions between the referrer and the diagnostic imaging provider. Clinicians and/or providers unable to agree a mutually satisfactory resolution to image delivery should utilize the Issues Resolution Process set out below.

The issues resolution process has been agreed upon by ADIA, RANZCR, and the RACS. The issues resolution process is applicable for use when dealing with matters of conformance to the Code of Practice content only when direct communication between the referrer and the diagnostic imaging provider do not resolve image delivery issues.

ADIA and the RANZCR recommend that the referrer or the diagnostic imaging provider contact the RANZCR by letter or online through a form on the RANZCR web site (www.ranzcr.edu.au).

Utilization of the form is recommended so that the RANZCR (and ADIA, where an ADIA member is involved) may be informed of any instance of poor or inappropriate image provision, where direct communication between referrer and the diagnostic imaging provider has been unproductive. ADIA's actions in the Digital Imaging Issues Resolution Process in respect of ADIA members are set out in Attachment 1.

The form will elicit information about the referrer's imaging requirements, the diagnostic imaging provider in question and the nature and extent of attempts to communicate directly with the diagnostic imaging provider to resolve the issue.

7. Contingency Plans

All diagnostic imaging providers should have in place contingency plans for events preventing the referrers preferred media from being distributed. Such disaster recovery plans should facilitate an uninterrupted service.

References

1. ELLIE AVRAHAM FB, CHISTOPH DICKMAN, SANJAY JAIN, TOY LEGGET, CINDY LEVEY, COR LOEF, PAUL NAGY, KEVIN O'DONNELL, JOHN PAGANNINI, TONY PALMER, PUAL SEIFERT, NICKI WIRSZ. IHE Radiology User's Handbook (2005).
2. RANZCR. Position Statement on International Clinical Teleradiology (2007) Unpublished.
3. MACISAAC P. Diagnostic Imaging Standards for Portable Media Project RANZCR Quality Use of Diagnostic Imaging Program - Specification for Exchange of Digital Imaging and Reports (2008).
4. MACISAAC P et al. Draft Code of Conduct for Digital Image Management. Unpublished February 2008.
5. AUSTRALIAN GOVERNMENT DEPARTMENT OF HEALTH and AGEING - MBS Medicare Benefits Schedule, ISBN 1-74186-363-5 (1 November 2007).
6. MACISAAC P Report of QUDI Project QR01iii, Diagnostic Imaging Standards for Portable Media Phase 2. Requirements for Exchange of Digital Imaging and Reports.RANZCR March 2008.

Bibliography /Literature Review Documents

1. MATTHEW SWAIN, PAUL O'KEEFE (2006) Stage II: Draft Standards Quality Use of Diagnostic Imaging QS7 (ii) Establish technical standards for accreditation requirements for clinical teleradiology.
2. INTEGRATING THE HEALTHCARE INDUSTRY (2007) IHE Technical Framework Volume I Integration Profiles.
3. MACISAAC, P (2007) Summary report to Participants Great Aussie CD Challenge – November 2007.
4. THE ACCREDITATION GUIDELINES AND QUALITY COMMITTEE (2008) The Royal Australian and New Zealand College of Radiologists Standards of Practice for Diagnostic Imaging – Version 8.0 Interim Standards for Public Consultation.
5. http://DICOM.nema.org – web content
6. http://www.ihe.net – web content
7. http://www.ranzcr.edu.au – web content
8. http://www.standards.org.au- web content

ADIA's Actions in Digital Imaging Issues Resolution Process