

THE COLLEGE OF
RADIOGRAPHERS



RADIOGRAPHY

**Medical Image
Interpretation &
Clinical Reporting by
Non-Radiologists:
The Role of the
Radiographer**

THE SOCIETY OF
RADIOGRAPHERS





Medical Image Interpretation & Clinical Reporting by Non-radiologists: The Role of the Radiographer

College of Radiographers' Responsible Officer:

Christina Freeman

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The College of Radiographers

207 Providence Square

Mill Street

London SE1 2EW

Telephone: 020 7740 7200

Facsimile: 020 7740 7233

E-mail: info@sor.org

Website: www.sor.org

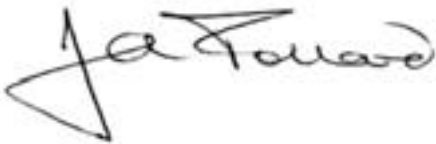
Foreword

Managers, education providers and radiographers involved in image interpretation and clinical reporting will find this document valuable in clarifying the role of the radiographer. Furthermore, The Society and College of Radiographers is currently working with The Royal College of Radiologists to develop a declaration on skills mix and this will provide more clarity on roles and responsibilities.

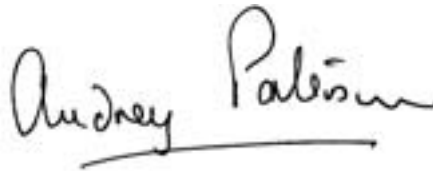
The Society and College of Radiographers defines the scope of practice of a radiographer as that which he/she is educated, competent and authorised to perform, and thereby makes it clear that there are no boundaries to practice.

Radiography services are central to delivering fast and reliable diagnosis of disease. As such, radiographers take responsibility for managing the complete radiographic episode within the continuum of care. In its role as the professional body for radiographers, The Society of Radiographers is pleased to provide support and encouragement to radiographers to further develop their roles for the benefit of the patient.

The Society and College of Radiographers is grateful to Val Challen, formerly Director of the Centre for Development of Learning and Teaching, St Martin's College, Lancaster for all her hard work in producing this advice document for the profession.



Mrs Ann Pollard,
President



Professor Audrey Paterson

1. Background

In 1997, the vision paper produced by the College of Radiographers (CoR) stated as its policy that the reporting of images by radiographers was “not an option for the future but is a requirement”¹. This was in a measured way in response to the 1995 statement by the Board of the Faculty of Clinical Radiology Royal College of Radiologists (RCR)² that “there may be no statutory impediment to a non-medically trained person reporting a radiological examination and making technical observations, *but the person without a medical training cannot reasonably be expected to provide a medical interpretation*”. It also built on the CoR Code of Conduct statement of 1994³ which promoted the view that radiographers should provide verbal and written reports on image appearances - thus formalising the previous informal practice of providing verbal comments on images, especially to Accident & Emergency (A&E) staff. This, in addition, built on the red dot system of calling attention of A&E staff to abnormalities, a task which had previously been recommended as standard practice some 20 years ago by medical staff⁴.

The 1997 vision paper led onto the 1998 joint paper from the CoR and the RCR⁵ which outlined the interprofessional roles and responsibilities of a radiology service where certain tasks formerly undertaken by radiologists, under certain safeguards, may be delegated to the radiography staff. This paper defined a delegated task, such as radiographer reporting, as to produce a descriptive report in accordance with a protocol agreed by medical members of the radiology team. The term descriptive report, meaning a description of the findings in the image was contrasted with the term medical report, meaning a medical interpretation and/or opinion on the further medical management of the patient. A medical report, the RCR considered, could only be provided by an appropriately trained registered medical practitioner, normally a radiologist.

2. Rationale for extension of image reporting to non radiologists

In the six or more years since this joint paper was published, there has been a number of major technological, demographic and educational developments that impacted on the clinical imaging service and on radiologists and radiographers alike.

Diagnostic imaging and interventional services have increased by 2.5-5 per cent per annum over the period of the last 10 to 12 years with some of the biggest increases being in complex and time consuming techniques such as Computed Tomography (CT) [40% between 1996-2002] and Magnetic Resonance Imaging (MRI) [60% between 1997-2002]⁶. This increase in demand for radiological services has put a further strain on departments during a period when there has been acute shortages in the number of radiologists in the United Kingdom despite a significant increase in the number of radiologists in training between 1995-2000⁷. Because of the increased demands required of the radiology service especially in cross sectional imaging and interventional procedures together with radiologist shortage, it has been reported that some criticism has been leveled at some aspects of the reporting service provided. Although priority is given to reporting emergency and urgent examinations, it appears that most hospitals are failing to meet their own standards for the speed with which images are reported both for these examinations and for routine examinations⁸. Government plans⁹⁻¹⁰ to improve the quality and immediacy of healthcare delivery are inevitably threatened by staff shortages.

Non reporting runs contrary to the RCR standards and the legal requirement that each radiation exposure must be justified and a clinical evaluation is recorded for each medical exposure. The Ionising Radiation (Medical Exposure) Regulations (IR[ME]R) has stated that a competent person should undertake such an evaluation to ensure patient care¹¹. This has enabled some radiographers with a post graduate diploma in reporting in some National Health Service (NHS) facilities to report on images arising from requests from A&E departments. This radiographer reporting service is by no means wide spread across the country despite a large number of radiographers possessing post graduate qualifications in trauma reporting. RCR standard is that examinations should only be reported by radiologists, by radiographers within agreed protocols or by specific referring clinicians following agreement with the radiology department¹². Hulbert et al's audit of litigation¹³ in four A&E departments concluded as early as 1996 that timely x-ray reporting probably reduces the risk of litigation. Previously the Audit Commission drew attention to the criticism leveled over the tardy receipt of reports by clinicians, reports which could well have influenced patient management¹⁴.

The need for radiographer reporting to help alleviate the radiologists' workload has been identified over a number of years in many papers from Loughran in 1994¹⁵ to Brayley in 2000¹⁶. Yet this is not the only rationale for radiographer reporting. It has been argued that is in the best interest of both patients and NHS Trusts to reduce the reporting interval for A&E imaging examinations to the minimum and this is where radiographers can play an important part with Senior House Officers, Nurse Practitioners, clinicians and patients and others benefiting from hot reporting by radiographers¹⁶; of selected body areas¹⁷. Greater clinical utility comes about to the benefit of all¹⁸.

3. Skill Mix

The term 'skill mix' as applied to radiology (which includes diagnostic and therapeutic) implies the utilisation of expertise from radiographers (and others) to complement or increase the expertise available to patients and to provide both cost savings within the service and provide better patient care. The term skill mix has been around now for some 10+ years¹⁹ and has been evident previous to this time in other health care professional activities. Skill mix initiatives provide the opportunity for radiographers to achieve their potential thus contributing to the radiographer retention rates.

The 4-tier service delivery model structure for radiographers was introduced for clinical imaging roles in 2002 with the aim that it would offer radiographers a greater potential for an extended clinical career developing roles and responsibilities beyond those conventionally associated with radiography²⁰

Both the Audit Commission in 2002⁶ and the NHS Modernisation Agency²¹ in 2003 and the NHS Improvement Plan in 2004²², identified extended roles related to radiographer reporting were either well established or en route to be established in trauma & skeletal radiography; ultrasound; nuclear medicine; barium enema; upper GI tract; CT head imaging, mammography and to a lesser extent, in intravenous urography and chest images. It would appear that the majority of such roles were being undertaken by Advanced Practitioners.

Staffing in the radiology service accounts for 60 per cent of total expenditure so must be used effectively. The RCR are conscious that the delegation of tasks to radiographers can lead to significant advantages to radiographers and patients as part of the skills mix agenda⁷.

Evidence regarding reporting by radiographers includes a number of notable examples as follows.

Large bowel examinations.

According to Halligan in 2003²³ 50 per cent of all UK barium enemas were performed by radiographers and has been recognized to be to a standard comparable with the performance of radiologists^{24 25}. Where double reporting of double contrast barium enema examinations was undertaken by radiographers and radiologists there was a high standard of detection rates of significant lesions including colorectal neoplasms^{26 27} with an initial report by the radiographer and a confirmatory report by the radiologist recommended²⁸. Radiographers undertaking specialised training can report barium enemas to a high standard²⁹ and single contrast small bowel enteroclysis reporting and CT colonography with sensitivity equal to that of a consultant radiologist^{30 31}.

Ultrasound.

Obstetric ultrasound examinations and reporting have been undertaken by radiographers for some time now and is very well documented in the ultrasound press. Routine abdominal and pelvic ultrasound examinations when undertaken by imaging practitioners have been shown that there is no statistically significant difference in the accuracy of radiographers and radiologists when performing and interpreting routine abdominal sonography³².

Nuclear medicine

In 1997, Hogg et al identified that only 8 per cent of radiographers undertaking NM scans were involved in reporting images³³. There is not yet any official protocol for radiographer reporting in nuclear medicine, but Elliott in 2003 recognised that practitioners who do undertake reporting are seen to take greater pride in acquiring and processing scans, a process which eventually leads to a higher level of job satisfaction³⁴. Further studies in the ability of radiographers reporting NM scans have indicated no difference in accuracy of radiographers compared with third year medical registrars and better accuracy compared with second year registrars³⁵.

Mammography

Radiographers who have undergone specialist training have been shown through a number of studies that they are able to perform reporting levels of accuracy in classifying and reading screening mammograms to a high standard and, in many cases, comparable to that of radiologists^{36 37 38} and do not take longer to do so³⁹.

Chest

Despite the contention that chest radiographs are the most complex of all plain film radiographs, studies have indicated that the professional considered opinion of trained radiographers on requested chest radiographs would provide immediate and invaluable diagnostic care of the patient⁴¹. Specialised training of radiographers (and indeed radiologists) may be able to reduce the variations seen between experienced observers in the interpretation of chest radiographs^{42 43}.

Plain film A&E referrals

This is the area where most studies have been undertaken over the past 20 years or so. Berman et al in 1985 suggested that standard practice be adopted whereby radiographers signal abnormalities in A&E referrals - a practice known as the red dot system⁴. Subsequent research reports have noted that carefully selected and trained radiographers can report accurately A&E radiographs to a high standard⁴⁴, with a sensitivity and specificity similar to that achieved by radiologists^{45 46 47} and with no detriment to the quality of reports⁴⁸. Published in 2005, a meta-analysis of plain film reporting (of A&E referrals and other radiographs) by radiographers provides an evidence base to show that radiographers can accurately report plain radiographs in clinical practice⁴⁹.

The issue of radiographers' ability to develop expertise in reporting has been recently challenged due to their lack of medical training⁵⁰. There is a large literature on the development of expertise and particularly in the field of perceptual skills and visual diagnosis. This has important connotations for radiographer reporting, particularly as Robinson in 1997 identified that the weakest link in the chain of events which represents clinical imaging is the performance of the observer⁵¹. Wood⁵² notes that "the expert radiologist is highly adept at the visual management and synthesis of disease characteristics which are achieved by translating radiologic and anatomic patterns into diagnostic and management decisions". For the reporting radiographer to emulate this is a tall order, yet it is well documented that radiologists are prone to making interpretational errors^{42 51 53}. However, radiologists recognize that accuracy on its own is not the only criterion of an interpreter's performance. The pursuit of accuracy needs to be tempered with the clinical importance of any findings⁵⁴, hence the need for a strong understanding by the radiographer of clinical issues on which to base their approach to reporting. Radiographers do, however, need to learn from radiologists that, wherever possible, errors should not be treated as failure but as learning opportunities⁵⁴.

4. College Position

All the initiatives and developments that have gone on since 1997 make it now possible for the radiography profession to make a major step forward in achieving the College's vision of 1997. The College believes that the profession need not now have to wait for permission to undertake image interpretation and reporting from any other agency but that it can and must put forward a reasoned and evidenced based argument to enable this to become a reality within the next 5-6 years. It is envisaged that by 2010, clinical reporting by radiographers will become a core competence.

The College believes that it is now incumbent on all radiographers to include image interpretation, reporting and making informed clinical comments on the examination they conduct to patients, other clinical colleagues and to referrers. In doing so, radiography practitioners must comply with the HPC Standards of Conduct, Performance & Ethics⁵⁵, and with the Health Professions Council (HPC) Standards of Proficiency⁵⁶ and must be appropriately trained, competent and authorised to do so.

One rationale behind the NHS Radiography Skills mix report and the concordant development of the 4-tiers was the enabling process of a radiographer career ladder and the development of skills beyond the conventional. There now appears to be no reason why practitioners in an extension of the red dot system cannot provide an interpretation and written report for trauma radiographs provided there is sufficient and timely preceptorship and safeguards in place in agreement with the employing authority. Empirical evidence suggests that radiographers (and others) who are able to provide such service has major implications for patient management and has the capacity to revolutionise the cost effective treatment of patients⁵⁷.

Inevitably the move towards the ability of radiographers and their acceptance by others in undertaking certain reporting tasks as a core skill will be a gradual process. Radiographers, in the past, have perhaps not been sufficiently encouraged to achieve their full potential with their experience largely under recognized¹⁶ resulting in their perception of poor career development and progression⁵⁸.

The College sees no reason why clinical reporting should be a radiographer only extension of practice – the College has no dispute with other non-medical clinicians, eg nurse practitioners undertaking the task of image reporting as long as there is a nationally agreed standard. Having said that though it would appear that radiographers are best placed to undertake such activity rather than 'others' from outside the boundaries of radiology⁵⁹. One of the 10 key roles for nurses identified by the Chief Nursing Officer is the referral of patients for diagnostic x-ray examinations. In some areas of the UK, nurses are in addition to referring patients undertaking a reporting role especially with regard to A&E referrals. There is, as yet however, insufficient evidence to support this role. Similarly, comparisons in reporting accuracy between nurses and senior house officers have been made^{60 61} yet does not appear to imply achievement to a satisfactory level of ability⁶². Although radiographic interpretation is undertaken by both nurses and radiographers, there appears to be both interprofessional and intraprofessional variation in the range of permitted examinations⁶³. There is a need for the radiography profession to ensure that purposeful dialogue occurs with radiology and nursing colleagues in order to review and recommend a service delivery strategy that would prove beneficial to both to patients and other clinicians. The College of Radiographers is presently in talks with the RCR; currently there is no such dialogue with the Royal College of Nursing. The view of the College is that it wishes to see the reporting of A&E imaging examinations becoming an integral part of the first post competency expected of a radiographer-whether or not the employing trust has such a system in operation.

5. Recommendations

The College realizes that achieving this second stage of its 1997 vision paper may take some time to become accepted, not least by the radiography profession itself. It requires, amongst other factors, considerable investment in the education and development of the profession combined with careful management and informed judgment^{58 64}.

To this end, the College sees that the following issues will need to be addressed:

- All pre-registration undergraduate programmes to embed image interpretation and clinical reporting knowledge and skills into them at a level that enables the practitioner to provide informed comment on plain film and standard contrast agent examinations. The curriculum to include issues surrounding medico-legal aspects which will impact on the radiographer's practice. Essential, is the development of the ability of the radiographer to take into account the clinical context of the image and to understand the 'key pieces of the diagnostic puzzle'⁵⁴ which are inherent not just in the image but also in the clinical history, laboratory test results and the patients' previous radiographs. Hence the need to include clinical assessment within all undergraduate programmes.
- Radiography practitioners to include image interpretation and reporting skills, development and enhancement in their CPD and to evidence this. This may be a gradual process to bring all practitioners to the expected standard enabling an individual radiographer to undertake hot reporting of trauma radiographs in line with the scheme of work and protocols agreed with their employing authority.
- Advanced and consultant practitioners to have or to acquire and use significant reporting skills according to the nature of their practice.
- The role of the advanced practitioner will include the undertaking and reporting of such examinations as US/RNI/MRI/IVU/chest and abdomen/ barium examinations/ mammography/ CT Head scans and other examinations as expertise is developed over time and following the undertaking of post graduate training and education. The Consultant radiographer role may come within the province of what Friedenbergr calls the "supertechnologist" or "non-physician clinician" where sessional reporting by consultant radiographers becomes the norm in addition to their undertaking other more clinically based activities⁵⁷.

Educational requirements for advanced and consultant roles will require practitioners to further develop their skills in patient assessment, clinical reasoning and decision making. The understanding and development of factors relevant to evidence based radiological research will be a CPD requirement.

The College recognises that there will be considerable diversity in the employment profile of radiographers and will rely on radiologist involvement. Issues may be related to the following:

- Requirements of individual NHS Trust and private facilities;
- Individual differences amongst practitioners;
- Scope of reporting tasks in the form of protocols and schemes of work; whether these be hot reporting of A&E referrals; GP patient reports;
- Resources which must be available in the clinical environment eg human, books, web access, journals, etc;
- Opportunities to become clinically competent through attendance eg on ward rounds, at case conferences and at multi-disciplinary team meetings;
- Establishment of links with non radiographers who undertake reporting tasks;
- Mentorships/ preceptorships/ supervision - extent and duration;
- Volume of reports and opportunities presented to remain competent;
- Clinical governance and audit;
- Review and timings of reviews.

The Special Interest Group in Radiographic Reporting (SIGRR), first established in 1996 to provide a national forum for those with a special interest in radiographic reporting⁶⁵, produced a booklet in 2002 and a paper in 2004 comprising a policy and practice guide for reporting by radiographers⁶⁶. This paper, which provides means for a way forward for the College, has informed this present document. The SIGRR group envisage that reporting will, in time, become a core radiographic skill although they do recognise that not all radiographers may not wish to undertake clinical reporting⁶⁷.

It is recommended that a phased approach be undertaken.

6. Action Points

6.1 Education

The Society and College's 2003 publication entitled *Education and professional development: moving ahead* has also informed this present policy guide and reiterates that the status quo is not an option, the profession must move forward and willingly grasp the opportunities presented through the various government strategies which will impact on patient care through the use of its workforce talents⁶⁸.

At undergraduate level, courses seeking CoR accreditation or re-accreditation will be expected to include suitable modules that cover aspects relevant to image interpretation, clinical reporting and decision making which encompass both academic and clinical components. Medical clinicians should be involved in the educational process. The expectation to be that all qualifying radiographers will be able to provide an opinion by way of an initial written report on skeletal radiographs. Courses seeking accreditation or re-accreditation to include these elements no later than September 2010.

For all newly qualified radiographers, where the employing authority has introduced a radiographic reporting service, there should be assigned a 'reporting' mentor for a minimum period initially of 12 months. That mentor to be a radiologist or a suitably qualified radiographer delegated by a radiologist.

All courses educating assistant practitioners for transition to registered practitioner radiographer status will be required to include suitable modules that cover aspects relevant to image interpretation, clinical reporting and decision making which encompass both academic and clinical components thus undertaking considerable clinical and theoretical education in all aspects of image interpretation and clinical reporting. Courses seek accreditation or reaccreditation prior to September 2010.

All practitioners who have not undergone education and training at undergraduate or diplomate level in image interpretation, clinical reporting and decision making and who wish to be involved in the provision of a reporting service will be required to undertake an appropriate College of Radiographers accredited post graduate award. Preceptorship and mentoring to be provided by the employing authority during and after training.

All radiographers undertaking a reporting role should have as part of their educational requirements developed those skills and awareness of when to seek further opinion and advice from a radiologist.

All radiographers undertaking a reporting role must be involved in interdisciplinary education and training

Continuing Professional Development (CPD) will be a requirement of all radiographers to incorporate facets of evidence based radiology which may include journal club involvement and individual research activity. CPD activities must include attendance at case conferences; multidisciplinary clinical meetings; external workshop and conference attendance and the maintenance of a reflective journal.

Access to education and training materials will improve over the next six years and will include e-based learning opportunities eg under the Radiology Integrated Training Initiative. Radiographers and others must be provided with access to those modules which are designed to develop competencies in specified areas affecting their role²². This provision should be written into a scheme of work.

6.2 Conditions of Service

Radiographers must be provided with additional payment in recognition of both qualifications and added responsibilities. Issues surrounding pay and conditions should be addressed throughout the planning stage of a reporting service and written into any agreements between practitioners and their employing authority.

Where appropriate, and with suitable qualifications and experience which signals clinical expertise, there should be no restrictions on radiographers being rewarded with Advanced and Consultant practitioner status. There should be a nationally agreed tariff for radiographer grades concomitant with expertise.

Radiographers must have access (through protected time and ring fenced money) to CPD activities in order to keep abreast of current techniques and developments to renew and extend their skills base. This must be agreed at the planning stage of a reporting service.

Reporting radiographers must be provided with a full written scheme of work approved by the employing authority and must be made aware they are legally responsible for their acts or omissions.

Workload must be monitored to ensure the full range of examinations to be reported is available and that the reporting radiographer is able to function in a 'live' structured situation. Mentoring should enable formal opportunities during the week to liaise and consult with an experienced reporter⁶⁶.

6.3. Clinical Governance and Supervision

The RCR and SCoR are already in consultation and liaison and will be in a position in the not too distant future to provide a joint declaration on skills mix.

A single standard of reporting agreed by the CoR and the RCR should be developed

Exemplar protocols and schemes of work to be drawn up and agreed at the level that satisfies both the RCR and CoR requirements and which are accepted at national level. Alderson and Hogg have indicated the need for radiographers to practice within an agreed professional latitude (ability) which should be defined within a protocol. They reiterate the need for practitioners to know the limits of their practice and that the protocol should define the circumstances for seeking help and advice from a clinician preferably a radiologist. Any protocol developed should be informed by the evidence and peer practice⁶⁹. Radiographers need to be aware that specialist practice may place them in situations which put them at risk of a legal claim⁶⁹. The drawing-up of protocols therefore must be inclusive of such outcomes of practice.

Clinical governance provides the rationale to develop and sustain a culture of audit within the clinical imaging sphere in order to promote and maintain high quality health care delivery with the patient at the heart. The RCR since 1999 has advocated the process of role extension where this provides significant advantage for the patient and has provided guidance on the evaluation and development of skills mix initiatives⁷⁰.

The College is aware that any radiographer reporting policy which uses the evidence to underpin it must consider the problems of bias and methodological factors which may influence those studies and thus question the evidence base. Brealey et al in a number of studies advise caution in relationship to 'the frequency of bias that can affect the quality of radiographer plain film reading performance'^{71 72}; and assumptions made when choosing and applying a reference standard to radiographer reporting accuracy which is often of variable validity⁴⁹.

The special interest group advise that a periodic audit should take place monthly when a small but representative sample of reports from each reporting radiographer should be scrutinised. In addition, there should be a regular (possibly quarterly) assessment and re-assessment of competence of each reporting radiographer.

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The College of Radiographers

207 Providence Square

Mill Street

London SE1 2EW

Telephone 020 7740 7200

Facsimile 020 7740 7233

E-mail info@sor.org

Website www.sor.org