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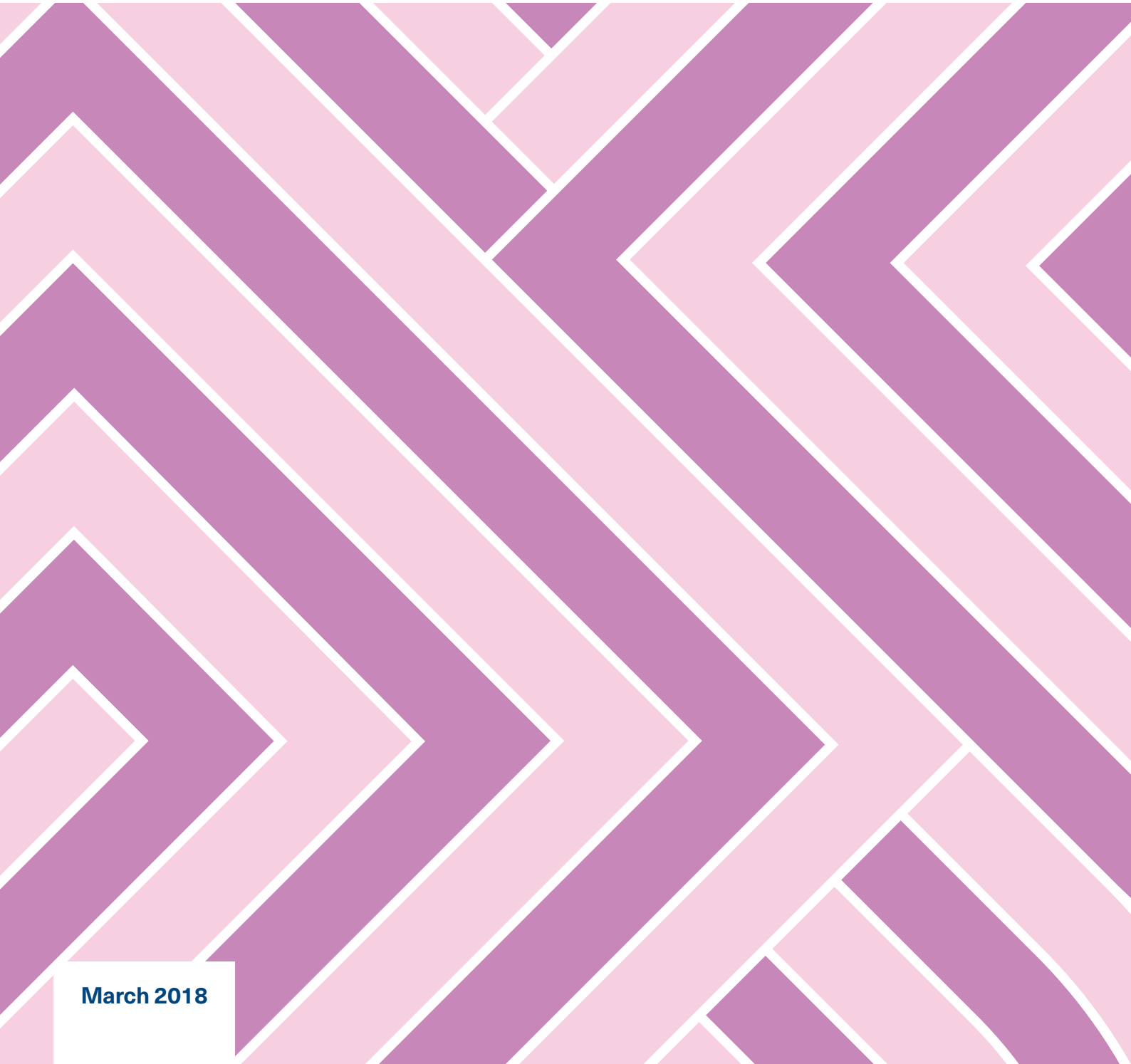
Clinical Radiology

The Royal College of Radiologists

Standards for interpretation and reporting of imaging investigations

Second edition



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RCR standards

The Royal College of Radiologists (RCR), a registered charity, exists to advance the science and practice of radiology and oncology.

It undertakes to produce standards documents to provide guidance to radiologists and others involved in the delivery of radiological services with the aim of defining good practice, advancing the practice of radiology and improving the service for the benefit of patients.

The standards documents cover a wide range of topics. All have undergone an extensive consultation process to ensure a broad consensus, underpinned by published evidence, where applicable. Each is subject to review four years after publication or earlier, if appropriate.

The standards are not regulations governing practice but attempt to define the aspects of radiological services and care which promote the provision of a high-quality service to patients.

Foreword

What do patients want from their radiology report? A report that takes into account their past history, previous imaging, current symptoms and signs and the results of other diagnostic tests. A report that accurately describes the imaging findings, a diagnosis or stratified list of differential diagnoses, with suggestions for further appropriate imaging, other investigations or patient management. They want it to be provided in a timely manner for reassurance, confirmation of diagnosis or identification of unexpected findings and for that report to be communicated to the referrer and/or appropriate multidisciplinary team with the degree of urgency, including failsafe mechanisms, related to the significance of the radiological findings or the urgency of the clinical scenario.

Diagnostic imaging is a medical act, integral to all medical intervention, and radiologists take clinical responsibility, providing a medical opinion on that imaging. Radiologists train to ensure competence and continuity across all imaging modalities and clinical scenarios. The interpretation and reporting of imaging investigations relies on wider clinical and professional interactions, where working in teams, overseen by governance systems that review the work of individuals, provides quality benefit.

This document, which defines the standards and best practice that patients should expect, emphasises the importance of actionable reporting, teamworking, close communication, peer feedback and learning and system improvement. It is aimed at radiologists and other reporters, fellow clinicians, NHS employing bodies and private employers, regulators (such as the General Medical Council [GMC], Health Care Professionals Council [HCPC], Nursing and Midwifery Council [NMC]), NHS Resolution, training bodies such as Health Education England (HEE) and NHS Improvement (NHSI), and quality improvement bodies in the devolved nations.

The RCR is extremely grateful to the authors of the original version in 2006, to those who assisted with the previous updates in 2009, 2012 and 2014, but particularly to Dr Neelam Dugar who was the principal author of the current update, helped by other members of the Clinical Radiology Professional Support and Standards Board, and to Dr Andrew Smethurst, Medical Director Professional Practice, Clinical Radiology, its principal editor, as well as to members of the Clinical Radiology Faculty Board and other Officers for their input.

Dr Nicola H Strickland
President

Reporting standards

A summary of the key standards outlined in this document

1. A radiology report should be actionable and prompt appropriate care for the patient. It should answer the clinical question and include a tentative or differential diagnosis when an abnormality is seen and relevant negative observations if pertinent.[1]
2. The wording of the report should be unambiguous and should take into account the professional background of the referrer. Further investigations or specialist referral should be suggested within the report when they contribute to patient management.
3. When reporting imaging studies, the reporter should take into account and review pertinent prior studies from the same and different imaging modalities, all the relevant clinical information, laboratory results and histopathology reports.
4. Where there is a need for a long, descriptive report, it should conclude with a short summary of key findings and their interpretation (with appropriate clinical advice on the next step of management, if appropriate).
5. All reporters of imaging studies should use the hospital's radiological information system-picture archiving and communications system (RIS-PACS) to document their reports formally, and the reports should be visible on the electronic patient record (EPR).
6. When there are imaging findings that constitute a medical emergency or a significant unexpected finding, reporters should comply with local mechanisms to alert referrers.
7. Reporters should supplement their written report with verbal dialogue when appropriate. There should be a reliable way for a referring clinician to discuss difficult cases in more detail with the individual who reports the investigation.
8. Reporters should formally record *ad hoc* reviews and second opinions as supplementary reports (or addenda), and should draw this to the attention of the referrer if the interpretation of the imaging study is thereby significantly changed, so that patient management decisions are based on the most up-to-date opinion.
9. Systematic feedback from the referring clinicians should form part of the individual professional's clinical practice (for example, multidisciplinary team meetings [MDTMs]). This systematic feedback should be defined in the reporter's scope of practice.
10. All reporters of imaging studies should be fully integrated into systems of quality assurance in reporting, for example, through participating in learning from discrepancy meetings (LDMs) and receiving frequent feedback on their reports (for example, peer feedback and MDTMs).
11. For patients to have confidence in the service, objective standards are required for all reporters. This should include a nationally calibrated exam and curriculum (for example, the Fellowship of The Royal College of Radiologists [FRCR]), followed by formal continuing professional development (CPD), annual appraisal and five-yearly revalidation (or equivalent).
12. In the interest of patients, all reporters should be registered and have a licence to practice (or equivalent) with the appropriate regulatory authority (for example, the GMC for radiologists and teleradiologists reporting for UK patients).
13. The professional status and regulatory registration details of the reporter should be clear on all written reports.

14. The individual signing the report is accountable and takes responsibility for the content of that report.
15. Teamworking is important for all reporters. When image interpretation and reporting is delegated to non-medically qualified reporters, they should work in teams with ready access to medically qualified reporters (generally radiologists) for medical advice and second opinions. Radiologists, and other reporting doctors, should have access to a second opinion from a radiologist at the time of reporting, or soon afterwards, if required.
16. Radiologist and non-radiologist reporters should only work within their scope of practice and competence.

1. Introduction

Purpose of a radiology report

The purpose of an imaging report is to provide an accurate interpretation of images in a format that will prompt appropriate care for the patient. Imaging reports should relate the findings, both anticipated and unexpected, to the patient's current clinical symptoms and signs and to the results of other investigative tests and procedures. When appropriate, the imaging study report should incorporate advice to the referring clinician on further investigation, management or referral to another specialist team.

Actionable report

An actionable imaging report should answer the clinical question asked by the referrer. It should also be worded so that it prompts appropriate action for the patient.[1] When an abnormality is seen, a diagnosis should be provided. In some circumstances a tentative or differential diagnosis may be more appropriate. Advice on the next step of patient management is important to ensure timely clinical decisions for patients. Advice on patient management may include suggestions for further investigations (radiological or non-radiological) or referral to another specialty or multidisciplinary team (for example, cancer teams). The report should include a degree of confidence in the diagnosis (for example, suspicious of, consistent with). The reporter should understand the urgency of patient management and issue failsafe alerts where urgent action is required.[2]

Patient safety and outcomes

Patient safety and optimal outcomes require timely, accurate, actionable reporting of imaging investigations. This applies irrespective of what type of healthcare professional reports the patient's imaging, or in which setting for example, the local radiology department or teleradiology reporting. Individuals who perform a limited number of examinations outside a team setting are most at risk of inadequate performance.

High-quality imaging reporting requires robust clinical governance processes. These include feedback to reporters with patient outcomes on investigations they have reported. This happens via participation in MDTMs and peer feedback messages. Participation in LDMs is important for individual and collective learning, as well as for systems' improvement.[3,4]

Qualifications and training of professionals involved in reporting

Radiologists report the vast majority of radiology exams across the world. Radiologists are medically qualified doctors and are trained in observation and in the analytical and interpretative skills of imaging investigations from multiple modalities. UK training of radiologists includes medical qualification with postgraduate training of at least seven years, consisting of at least two years general medical experience, followed by five years specialty training, success in the national FRCR examination and five satisfactory annual reviews. This is followed by annual appraisal of consultant radiologists, and five-yearly revalidation by the General Medical Council (GMC) to assure their continued fitness to practice. The 12 years of undergraduate and postgraduate training required to qualify as a radiologist yields enormous professional skills which benefit patients through accurate diagnoses, as well as timely and safe medical management decisions.

Non-radiologist doctors have the same initial undergraduate medical school and postgraduate two years general medical experience as radiologists but lack the formal five years specialty training in radiology that radiologists undergo, and they do not hold the national FRCR examination (or any imaging examination).

Non-doctors – allied healthcare professionals (AHPs) (for example, radiographers, physiotherapists) – have not undergone medical school training. There is currently no national curriculum or national examination for AHPs undertaking imaging study reporting; the type and length of training courses vary around the country.

Delegation of reporting to non-radiologist doctors

Delegation of reporting to non-radiologist doctors applies to the interpretation of imaging studies relating to a body part/system or particular modality in which that doctor is already a clinical expert (for example, the reporting of cardiac magnetic resonance (MR) or computed tomography (CT) studies by a cardiologist; the reporting of nuclear medicine studies by nuclear medicine physicians). These doctors will be at a disadvantage compared with radiologists in observing and interpreting the imaging findings of other body organs/systems included in the imaging study being reported and in correlating the findings with those shown by other imaging modalities with which they are less familiar.

Delegation of reporting to non-doctors

Delegation of reporting to non-doctors (AHPs), apart from in ultrasound, has commonly involved a single body system and modality (for example, musculoskeletal plain radiographs), or a relatively simple 'yes/no' answer (for example, ?fracture), where comparison with examinations using other modalities is unlikely to be of benefit. Non-doctors will not be able to interpret the full range of imaging modalities, and therefore they will not be able to corroborate with findings available on relevant previous imaging using another modality (for example, findings on a previous chest CT when interpreting a chest radiograph) or to look for evidence of the same disease process affecting other organs (for example, tuberculosis or systemic sclerosis). In addition, non-doctors will not always appreciate all the implications of the clinical history, clinical examination and investigative test results, which may be of relevance to the interpretation of the imaging study. Their lack of knowledge of many medical conditions raised as possible diagnoses in the referring details will limit their ability actively to assess the images for certain radiological signs expected in these conditions, and where pertinent, to document the presesnce/absence of these as relevant positive/negative findings in their reports (for example, a given history of 'HLA B27' for a lumbosacral spine examination). These limitations resulting from the lack of both medical knowledge and multi-modality radiological training, must be borne in mind when deciding what type of imaging study reporting can be delegated to non-doctors so as to incur minimal risk to the patient.

Imaging findings cannot be predicted in advance, and it is a false premise to assume that a subset of 'uncomplicated' examinations can be identified prospectively as a potential worklist for a non-radiologist.

Teamworking is best practice for any reporter. It is essential that non-doctors have immediate access to medical radiological opinion and advice, and do not work autonomously. Non-radiologist doctors should also have ready access to radiological opinion. Radiologists themselves require timely access to a second radiological opinion when in training or if desired.

If a radiological second opinion is deemed necessary, but is unavailable for some reason when a report has to be issued urgently, the report should be issued with 'preliminary status' clearly stating that a radiological medical opinion has been sought so the referrer is aware of this.

Radiologists and employers have a duty of care to patients to ensure that when they delegate the reporting of imaging investigations to non-radiologists, those individuals should have been trained to a national standard and only practise within their scope of practice and competence.

Teleradiology, outsourced ultrasound reporting and home reporting

The term teleradiology refers to the reporting of imaging examinations at a distance from where these examinations were performed, by reporters who are usually unknown to the referring doctors and local radiographers. Teleradiologists are often unfamiliar with local patient care pathways. Teleradiology has been successfully used for night-time emergency radiology, allowing for collaborative working by one radiologist covering multiple hospitals at night (this maybe via NHS or private collaboratives). Teleradiology could also be used in the short term when trusts/healthcare institutions have large reporting backlogs and are unable to recruit to existing posts. Outsourced ultrasound service reporters face the same challenges as teleradiology reporters. Institutions involved in outsourcing ultrasound should ensure that reports produced are actionable, and the images and reports are integrated into the referring clinicians' radiology information systems-picture archiving and communications systems (RIS-PACS). Trusts/healthcare institutions using teleradiology reporting services should ensure that the quality of the service to the patient is not compromised compared with local radiologist reporting. All who report imaging of patients in the UK, wherever in the world, should be registered with a UK healthcare regulator and comply with their requirements, for example, revalidation. Documentary evidence of this is essential before outsourcing imaging reporting.[5]

For elective radiology reporting, reporting by local radiologists familiar to the local radiographers and referring clinicians is to be preferred, as actionable reporting is facilitated by regular clinical dialogue. With advancing technology, flexible efficient home reporting by local radiologists is now possible. Home reporting by local radiologists could be an alternative to outsourced teleradiology for backlog reporting.

Artificial intelligence assisted reporting

The application of artificial intelligence (AI) will augment radiologists' reporting of imaging investigations. It will facilitate fracture, lung nodule and breast cancer detection. It will also help identify imaging studies considered to be abnormal (outside the spectrum of the normal range) and prioritise their reporting by radiologists. AI will also help in providing more accurate quantification of the response to treatment by comparing the sequential size of abnormalities detected on scans, especially in cases of cancer follow-up, and by assessing other factors on serial scans such as the rate of lesion contrast enhancement. AI benefits from not suffering from fatigue, not being constrained by social working hours or being influenced by biasing emotional factors. However, problems will remain with false-negative and false-positive identification by AI software, which will require validation by a human reporter. Much needs to be done to define the appropriate use of AI in the reporting of imaging investigations, setting standards for AI interoperability, testing AI algorithms, as well as addressing regulatory, legal and ethical issues.[6]

2. The essential steps in producing an imaging report

A radiological report, when issued by a radiologist, constitutes a medical opinion. It is NOT an automated measurement. Patients are best served if their imaging report consists of not just an observation of imaging findings, but provides a medical interpretation of those observations as a holistic analysis factoring in their symptoms, physical signs, past medical history, previous imaging, laboratory and other clinical test reports, referrers' suspicions and pre-test clinical probability.

Clarifying the steps involved in producing imaging reports explains why the majority of reports are issued by radiologists. It also makes it possible to evaluate which examinations may reasonably be reported by non-radiologists or by radiologists practising remotely, possibly in a different part of the world (such as teleradiologists).

Understanding the clinical information

Referring clinicians should provide information on the request form that they think is relevant to the interpretation of the images. The main specialty of the referrer should be clear – as defined in the NHS data dictionary.[7] The reporter should word the report and provide advice, taking into account the specialty of the referrer. The clinical information provided in the requesting details might include medical symptoms/signs pointing to a particular diagnosis or range of diagnoses, or might enumerate the possible diagnoses that are being considered. The individual reporting the investigation should understand the explicit and implied information given in the clinical details, in particular, all the named diagnoses/conditions and the relevance and diagnostic importance of any test results supplied, and their significance for the interpretation of the imaging study. They should also have knowledge of commonly used medical abbreviations and acronyms.

Technical knowledge

Producing images of diagnostic quality requires skilled and appropriately trained healthcare professionals, usually radiographers. The individual reporting the examination must be able to evaluate the quality of the images and their suitability for diagnosis. Where the images are suboptimal or incomplete, for example insufficient sequences acquired in a magnetic resonance imaging (MRI) study, the wrong phase of contrast enhancement having been imaged or movement artefact, these factors must be appreciated by the reporter who must also have sufficient technical knowledge to know to what extent this will affect the diagnostic accuracy of the examination; and whether the patient needs to be recalled for a repeat or further examination or caveats included in the report.

Observation

Careful cross-checking of patient identification is required as part of the initial assessment of the image/s, together with confirmation that the type and date of the examination are correct. Both 'passive' and 'active' observation are used by radiologists and other reporters – abnormalities will strike those with a trained eye, but the images should also be specifically and methodically interrogated, in appropriate viewing conditions, actively seeking specific imaging findings expected in certain possible diagnoses and to ensure that all findings have been noted. On the basis of these observations the following may be found:

- Normal findings
- Unequivocal abnormal findings, both anticipated and unanticipated

- Findings that may be normal or abnormal
- Normal variants
- Relevant negatives.

Image analysis

Definitive or equivocal abnormalities are then further evaluated for relevant imaging characteristics, for example shape, contour, density, enhancement pattern, signal intensity and echogenicity, to formulate an opinion on whether there is an active pathological process present or whether the finding can be encompassed within the range of normal appearances, including age-related change and insignificant anatomical variants; or whether it is due to radiographic artefact, such as a finding related to projection, or is explained by old 'burnt-out' or chronic pathology. If the findings are considered to represent an active pathological process, the image characteristics are further scrutinised to narrow the differential diagnosis and categorised as, for example, probably benign or suspected malignancy.

Analysis of prior multi-modality imaging

Previous imaging investigations and reports should be available for instant, simultaneous comparative review with the current study. Reporters should synthesise their report using other relevant examinations from the same and different modalities, including plain radiography, ultrasound, CT, MRI, positron emission tomography-computed tomography (PET-CT), fluoroscopy, nuclear medicine studies and angiography. The reporter should be able to correlate appearances on the different types of imaging and understand the limitations of each modality type. Radiologists are trained in multi-modality image interpretation and the FRCR exam assesses multi-modality interpretation skills.

Analysis of medical information

Imaging abnormalities should be correlated with other factors for example, age, sex, past medical history, current clinical presentation and medication, to determine the significance of the imaging findings to that particular patient. For complex image reporting in particular, a comprehensive medical knowledge is required to reach a specific diagnosis, or an appropriately ranked differential diagnosis, sufficient to allow clinical decisions to be taken, that is, actionable reporting. Where further information may substantially influence the radiological opinion, this should specifically be sought by discussion with the referring clinician, reviewing clinic letters, discharge summaries, MDTM outcomes, laboratory/histology reports and so on. Access to the full local imaging history on PACS (or a teleradiology platform) is essential for accurate reporting. Ideally reporters should have access to a full imaging history for the patient, that crosses organisational boundaries for improved report quality. There should also be one-click access to blood results, histopathology reports, clinic letters, discharge summaries and so on from the reporting application (RIS or network teleradiology platform [NTP]). Such holistic analysis enables actionable reporting that will give patients the best chance of timely, correct treatment.

Advice

The individual reporting an examination should be aware of the likely accuracy of the examination in that particular patient related to the published accuracy of the technique, and its applicability to this particular examination, factoring in quality of images obtained,

body habitus and so on. The level of certainty or doubt surrounding an imaging diagnosis should be clearly indicated in the report. If a definitive diagnosis is given, it should be assumed that this will be used for patient management. If a definitive diagnosis is not possible, then a likely diagnosis should be indicated, or ranked differential diagnoses should be provided. Advice about further investigation, both imaging and non-imaging, may be appropriate. Advice may also include referral to an appropriate type of specialist or multidisciplinary team.

Communication with the referrer

The author of an imaging report, and his/her professional status and registration details should be clear to those reading or receiving the report.

The purpose of the report is to provide a timely answer to the clinical questions posed, together with a holistic assessment of all the images for relevant and/or unexpected findings. The written report should be clear, and written in a way appropriate to the referrer's expected level of familiarity with the imaging abnormalities detected, the implications for the patient and the referrer's access to requesting further investigations. The wording of the report is likely to differ when it is written to a general practitioner (GP) who may be unfamiliar with a relatively rare condition, compared with a specialist in that particular field.

The usual format should include (particularly for long complex reports):

- Clinical details (unless the requesting details are readily accessible for review)
- A description of the findings
- A conclusion or summary of the key findings in the clinical context
- Advice on the next step of management (when appropriate).

The report should be actionable and should therefore convey a knowledgeable and reasoned assessment of the examination and its contribution to the overall management of the patient.

Dialogue and discussion

Reporters should support their written report with verbal communication when required. Radiology departments should provide a reliable mechanism whereby the referring doctor can discuss the imaging findings in complex cases with a radiologist/reporter in order better to understand the implications and reliability of the findings, or to provide further clinical information which may alter the interpretation.

Dialogue between referrers and reporters of imaging investigations, both *ad hoc* and in regular clinico-radiological meetings, is essential for patient safety. Regular participation at cancer MDTMs and other clinico-radiological meetings is essential for actionable reporting. The vast majority of NHS radiologists participate in at least one MDTM/clinico-radiological meeting each week. This ensures insight into the imaging findings that determine treatment decisions, as well as enhancing the quality of reporting via feedback of operative findings, histopathology and clinical patient outcomes.

Direct communication by telephone is clearly indicated if a patient has a medical or surgical condition requiring emergency management. Additional mechanisms for ensuring that the referrer receives the report in a timely fashion are also indicated when the usual methods of report transmission could lead to delays in treatment. Imaging findings that suggest serious

pathology, for example, probable malignancy, that are thought to be unsuspected should be communicated in a manner that reasonably ensures timely treatment. This should comply with agreed local alert mechanisms. Urgent communication may also be required to prevent potential harm to others, for example when there is evidence of active tuberculosis. When additional steps have been taken to ensure urgent communication of imaging findings, this should be recorded in the report.[2]

Communication with the patient

The patient should always be treated with respect and honesty. If the patient asks what an examination has shown, it may be neither possible nor desirable to give a definitive result immediately, if the radiologist or individual reporting the examination has not had time to make a thorough assessment of the investigation. The reporter should explain this to the patient. Where the reporter may have to convey bad news to a patient relating to the imaging examination findings, s/he should have received appropriate training to do so. Communicating such information to the patient may be better deferred until the patient can be appropriately supported, such as in the presence of a cancer nurse in a clinical outpatient setting. It is inadvisable for the reporter to enter into any detailed discussion about further management with the patient unless the individual has sufficient knowledge to do so. If a reporter discusses the imaging findings with the patient, s/he should ensure that there is appropriate follow-up with someone who will be involved in the patient's further care and can answer the patient's subsequent questions.

Patients now have access to medical correspondence about them, and in some cases this will include radiological reports. This should be borne in mind in the wording and style of the report.

3. Quality assurance and governance

Elective reporting of referrals from clinical specialists

NHS radiologists, both in tertiary centres and district general hospitals, participate in many specialist MDTMs. These radiologists become specialists in these fields by virtue of training, self learning and regular MDTM participation. The importance of reporting supplemented by referrer–reporter dialogue is essential for optimal patient outcomes. Radiology departments should have reporting practices that allow elective work allocation to relevant MDTM radiologists (both district general and tertiary centre radiologists have experts/specialists by MDTM participation). This facilitates actionable reports, as MDTM radiologists best understand patient management for those diseases and organ systems they encounter frequently and can provide enhanced advice. Specialties that request smaller numbers of imaging studies (for example, paediatrics, head and neck imaging) should consider collaborating with a neighbouring hospital using an NTP.[8] This would reduce variations in reporting quality within the NHS. *Ad hoc* second reviews or MDTM reviews should be recorded on the RIS and distributed in the same way as primary reports (electronically to PACS, electronic patient record [EPR] +/– paper). Failsafe alerts should be issued following second reviews, if appropriate.

Emergency reporting (referral from the accident and emergency department [A and E] and imaging of ward patients)

Reporters involved in interpreting examinations referred from A and E and ward patients should understand appropriate emergency management of these patients and provide

advice on specialist referral where appropriate (for example to a stroke physician, surgeon or interventional radiologist). When an incidental probable cancer is found on emergency imaging, reporters may refer to the appropriate cancer MDTM for discussion, staging and management decisions (or follow appropriate local failsafe alert practices).

Reporting investigations referred from GPs and other generalists

Most GPs are unable to review radiology images themselves (because the imaging studies are not transmitted to their practices and because their workload precludes study of the patients' imaging studies). Hence, actionable reports are essential for them and their patients. Reports issued for GPs should always answer the clinical question posed in the requesting details. Appropriate advice on further investigations or specialist referral should be given when an abnormality is detected. Advice should also be provided when the imaging is negative and the clinical context suggests the likelihood of significant undetected pathology. The wording of the report should be unambiguous and should take into account the professional background of the referrer.

Responsibilities (reporters and employers)

The employer should ensure that when a report is issued the professional status and registration details are clearly identified both on paper reports and on electronic reports sent to other information technology (IT) systems. Radiologists and other reporters are responsible for ensuring that their reports are actionable and that failsafe alerts are produced where appropriate. The reporter is accountable for the report s/he has issued. Radiologists and reporting teams should ensure that quality measures such as MDTM participation for feedback learning, LDM meetings and audits are followed. Employers, when delegating reporting to non-radiologists, should ensure that quality of reporting is not compromised and reports remain actionable for patients. Employers should invest in technology so that enterprise RIS have one click access to EPR information to support actionable reporting.

Employers should be mindful of the consequences for patients, the cost to the NHS from potential errors and the delay in patient management arising from reports that are not actionable. Employers have a duty of care to patients to ensure that no individual who reports imaging investigations is expected to work beyond their level of knowledge and competence or to work without adequate rest.

4. Technology for actionable reporting

Technology support for actionable reporting

For radiologists to issue actionable reports, they should have instant access to the full imaging history and be able to correlate the current with previous imaging and reports. They should have easy access to additional information such as blood results (for example, inflammatory markers, tumour markers, liver function tests, amylase levels) histopathology reports, clinic letters and discharge letters. Technology to allow a one-click in-context link from the RIS to these electronic patient record data residing in the EPR is essential in modern radiological practice. It is the responsibility of the hospital to invest in such technology to support safe and actionable reporting.

Reporting networks and sharing in cancer networks

Reporting largely occurs on enterprise-wide RIS-PACS solutions. However, for night-time radiology most hospitals use reporting networks (NHS networks or outsourced networks). Collaborative network (NHS or outsourced) based reporting uses an NTP. Cancer networks should ensure that there is investment in appropriate IT (such as a vendor neutral index) to enable sharing of images and reports across a cancer network.[8]

Reporting assisted by artificial intelligence

AI use in radiology will increase, with better algorithms using machine and deep learning. Computer vision AI is likely to act as second reader for radiologists both in the detection of abnormalities and in the identification of normal studies. The latter function will enable prioritisation of non-normal studies for radiologists' attention earlier in the worklist. The role of radiologists will move towards enhanced medical interpretation of images, the correlation of multiple imaging modalities with other medical information and quite possibly greater patient interaction in explaining the interpretation of their imaging studies to them in a clinical doctor-patient setting. It is essential that AI be integrated appropriately into the radiologists' reporting workflow, so that it makes radiologists more efficient and enables safer and actionable reporting.[6]

Approved remotely by the Clinical Radiology Professional Support and Standards Board: December 2017.

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Appendix A. Audit template for actionable reporting

This audit provides evidence on clinical quality and effectiveness.

Organisation and delivery

Organising this audit and delivering the audit report is the responsibility of the clinical director.

The cycle

1. The standards
   - Every department should aim to deliver actionable reporting.
   - There should be clear definition of actionable reporting – 'The report should answer the clinical question. When an abnormality is described a tentative or differential diagnosis should be provided.'
2. The indicators and targets
   - The report should answer the clinical question: target 100%.
   - When an abnormality is described a tentative or differential diagnosis should be provided: target 100%.
   - Not all reports will have advice on the next step. However, where advice is given, the advice should be appropriate: target 100%.
3. Data collection, exclusion and analysis
   - Data collection: choose a site-specific cancer MDTM (for example, lung) or non-cancer MDTM and review all the radiology reports for a specific time period sent to the MDTM (alternatively choose consecutive reports for a particular modality – ultrasound [US], CT, MRI and so on)
   - Exclusion: exclude reports which are normal.
   - Analyse both the request card and associated report to answer the following questions:
     - Did the report answer the clinical question?
     - Was a tentative or differential diagnosis provided for the abnormality?
     - Was advice provided regarding the next step?
     - Was advice provided for the next step appropriate?
   - Data analysis should include job role (consultant radiologist, specialty grade doctor, post-FRCR trainee radiologists, pre-FRCR trainee radiologist, non-radiologist doctor, radiographer, physiotherapist etc), referral type (emergency or elective) and employment status (NHS, locum or teleradiologist).
4. Resources needed
   - Personnel: clerical time to pull the necessary lists (MDTM lists etc) and radiologists' time to analyse the reports.
   - Time: allow eight hours per year for scrutinising records and preparing formal annual reports.

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