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Clinical Radiology

The Royal College of Radiologists

Standards for the communication of radiological reports and fail-safe alert notification

Faculty of Clinical Radiology

Contents

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 *improving the service for the benefit of patients by defining best practice, and promoting advances in practice.*

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.

All of the standards produced by The Royal College of Radiologists can be found on the College website www.rcr.ac.uk/standards

Current standards documents

Standards for providing a seven-day acute care diagnostic radiology service

Standards of practice and guidance for trauma radiology in severely injured patients, Second Edition

Standards for intravascular contrast administration to adult patients, Third edition

Standards for the provision of an ultrasound service

Standards of practice of computed tomography coronary angiography (CTCA) in adult patients

Cancer multidisciplinary team meetings – standards for clinical radiologists, Second edition

Standards for Learning from Discrepancies meetings

Standards for radiofrequency ablation (RFA), Second edition

Standards for patient confidentiality and PACS and RIS

Standards for patient consent particular to radiology, Second edition

Standards of practice and guidance for trauma radiology in severely injured patients

Standards and recommendations for the reporting and interpretation of imaging investigations by non-radiologist medically qualified practitioners and teleradiologists

Standards for the NPSA and RCR safety checklist for radiological interventions

Standards for the provision of teleradiology within the United Kingdom

Standards for a results acknowledgement system

Standards for providing a 24-hour diagnostic radiology service

Standards for providing a 24-hour interventional radiology service

Standards for Self-assessment of Performance

Standards for the Reporting and Interpretation of Imaging investigations

Standards for Ultrasound Equipment

Foreword

Accurate reporting of imaging studies is only part of what matters for patients. Timely effective communication of reports to those who treat the patient is also essential.

Despite the National Patient Safety Association (NPSA) *Safer Practice Notice 16 (SPN 16): Early identification of failure to act on radiological imaging reports* (appendix 1), published in 2007, and three subsequent RCR publications in 2008, 2010 and 2012, timely effective communication of all reports with critical, urgent or significant findings remains a problem.[1–4]

Communication delays can have very serious consequences for patients.

Communication challenges increase inexorably with ever more referrers, types of imaging, working across multiple locations, more pressures on clinicians, faster patient throughput and 24/7 healthcare.

This document describes, for each of those involved in the radiology reporting system, their responsibilities to prevent incidents. It is the responsibility of the radiologist to produce reports. It is the responsibility of the requesting doctor and/or their clinical team to read and act upon the report findings. It is crucial that all parts of this process are undertaken as quickly and efficiently as possible. It is the responsibility of the trust or other equivalent healthcare organisation to provide systems whereby, as soon as a verified imaging report has been produced, it is easily available to be read and acted upon by the referrer, their team and other relevant clinicians.

As the failure of these processes can have profound effects on individual patients' wellbeing, it is essential to develop fail-safe back-up mechanisms to prevent such failures occurring.

This document highlights the key responsibilities with regard to the primary system and these fail-safe mechanisms. It replaces *Standards for the communication of critical, urgent and unexpected significant radiological findings, Second edition* and is relevant to all radiologists.[4]

I commend this updated document to all those who have a responsibility in this area, at an organisational level, in leadership of clinical teams and in radiological services. Individual radiologists should also be aware of its content.

I would like to take this opportunity of thanking, in particular, Drs Neelam Dugar, Karen Duncan and Nicola Strickland for updating these standards. Dr Andy Smethurst, Medical Director for Professional Practice has provided detailed guidance and scrutiny. The RCR Radiology Professional Support and Standards Board as well as the Radiology Faculty Board have given feedback and advice that has greatly enhanced this publication. Dr Olly Hulson and Dr Jonathan Smith have provided the relevant UK medico-legal data.

Richard FitzGerald
Vice-President, Clinical Radiology
The Royal College of Radiologists

Recommended standards

Standard 1
All radiological reports should be produced, read and acted upon in a timely fashion, best to serve the patients' needs.

Standard 2
It is the responsibility of the radiologist to produce reports as quickly and efficiently as possible, and to flag reports when they feel a fail-safe alert is required.

Standard 3
It is the responsibility of employing organisations to ensure appropriate reporting and fail-safe systems are in place and to audit regularly (see suggested audit template in Appendix 2).

Standard 4
It is the responsibility of employing organisations/radiology departments to ensure that reports can be communicated to other information technology (IT) systems using HL7 standards (data items included in Appendix 3).[5]

Standard 5
It is the responsibility of the requesting doctor and/or their clinical team to read and act upon the report findings and fail-safe alerts as quickly and efficiently as possible.

Standard 6
It is the responsibility of employing organisations to provide IT systems whereby, as soon as a verified imaging report has been produced, it is easily available for tracking by clinical teams. All reports should be read and acted upon by the referrer, their team and/or other relevant clinicians, with a permanent audit trail of who has read the report and who has taken responsibility for acting upon it.

Standard 7
Efficient and effective electronic means of fail-safe alert notification require investment by trusts. Until there are robust systems of tracking and notification within electronic patient record (EPR) systems, manual processes via telephone, email or fax will continue to be required. Patient safety should remain the most important aspect in this process.[6]

Standard 8
Fail-safe systems should be IT based to reduce error and increase efficiency, but if facilities are not available, alternative manual processes should be in place.

Standard 9
If manual processes (for example, telephone calls, emails, faxes and so on) are required to support the fail-safe process, clerical/administrative staff should be available to support radiologists at all times of the day or night.

Standard 10
These standards apply to all investigating units, including NHS hospitals, independent sector services and teleradiology reporting providers.

1. Introduction

The issue of communication of reports has been highlighted as a problem for UK radiology departments for the past nine years, starting with the publication of the *Safer practice notice 16: Early identification of failure to act on radiological imaging reports* by the National Patient Safety Agency (NPSA) in 2007 (appendix 1).[1] The RCR has issued three previous guidance documents on this issue in 2008, 2010, 2012.[2–4]

A recent RCR audit found that only 34% of radiology departments have an automated alert system in place and even fewer (17%) have the facility for enterprise-wide tracking of radiology reports for referring doctors.[7] The current situation poses unacceptable risks and consequences for patients and radiology departments.

Recently, radiologists at Leeds evaluated 791 National Health Service Litigation Authority (NHSLA) settled claims involving radiology between 1997 and 2014 and presented their findings at the Radiological Society of North America (RSNA) conference 2015 as an e-poster.[8] From the data provided for claims between 1997 and 2011 (n=463), they found 14 settled claims where communication was directly implicated. There are, however, very many more which have simply been labelled as a 'delayed diagnosis of cancer' or similar, where it is likely communication played a part. The claims relate to alleged failures in the system of communicating unexpected or significant findings, failure to recommend an appropriate follow-up study, failure to act upon an examination report and so on. These claims led to significant payouts.

In the USA, there have been significant recent improvements in radiology report communication which have led to a reduction in primary malpractice claims related to communication (failures down to 1.3%, with communication failures being a contributory factor in 4.6%), but these claims had a statistically higher ratio of paid claims.[9] Evidence suggests that fail-safe alerts are being issued in the USA for 5% of radiology reports.[10] This produces a significant workload for radiologists and radiology departments.

2. Definitions of communication

There are three elements of communication with regard to the radiology report.

1. Language or content of the report

NPSA SPN16 (appendix 1) states that the radiology report needs to be clear, the critical elements should be emphasised and the action that needs to be taken by the referrer needs to be clearly stated.[1]
It is important that reporting radiologists ensure that reports document clinical advice and recommendations regarding patient management, where appropriate.

2. Transport mechanism of the report

Once a report is verified or authorised, it should be communicated to the referring/requesting clinician in a timely manner. Previously reports were largely communicated by paper and by post. However, nowadays all radiology reports within secondary care are communicated using digital technology to the picture archiving and communications system (PACS).

The global standard for communication of radiology reports from the radiology reporting application to the EPR, PACS or general practitioners' (GP) systems is via an HL7 observation result (ORU) message. Paper reports may still be printed and sent for inclusion in the paper clinical notes, which remain the integrated clinical record for much of the NHS, until NHS hospitals become truly paperless.

3. Fail-safe alerts communication

NPSA SPN16 (appendix 1) states that for critical and significant unexpected results, safety nets should be established with additional steps for communication – commonly referred to as fail-safe alerts.[1] It is a matter of professional judgement on the part of the reporting radiologist when additional steps need to be taken to supplement the normal systems of communication to referrers. The need for issuing fail-safe alerts will depend on the knowledge of the radiologist about the common working patterns within the referrer's institution – about how often results are read and by who.

There will be variations for cases where radiologists feel results may not be acted upon by referrers in a timely manner (for example, a chest X-ray from a gynaecologist showing a primary lung tumour and so on) thus creating an additional need to initiate safety net fail-safe alerts. Local policies of the referring institution will also define the need to send fail-safe alerts, for example, where there is a suspected but unexpected cancer on imaging.

Suggested categories for issuing fail-safe alerts

- **Critical and urgent findings:** Where emergency action is required as soon as possible, or medical evaluation is required within 24 hours.
- **Significant, important, unexpected and actionable findings:** Cases where the reporting radiologist feels that the findings are important and a fail-safe alert should be added to the normal communication method to ensure that they are acted upon in a timely manner.

3. National Patient Safety Association Safer Practice Notice 16

The NHS SPN16 (see Appendix 1) was published following the receipt of 22 reports where the failure to act on radiological imaging reports led to patient safety incidents, most of which involved fatalities or significant long-term harm.[1] Trusts were given a deadline of 28 April 2007 to agree an action plan, with an implementation deadline of 28 February 2008.

There were recommendations for actions by:

- The referring registered healthcare professional
- The radiology department and the individual reporting the study
- Medical and nursing directors.

Recommendations for referrers

- 'Ensure systems are in place to provide assurance that requested images are performed ... and that the results of these are viewed, acted upon accordingly and recorded. It is the referring health professional's responsibility to ensure that this is followed.'[1]
- 'When using hard copies of reports, ensure that they are reviewed, signed, timed and dated, and any clinical decision noted before filing in the patients' records'.[1]
- 'Always access electronic systems using your allocated log-on and, if acknowledgement functions for the receipt of results or reports exist, use them.'[1]

Recommendations for action by radiology departments and reporting radiologists and radiographers relevant to critical or urgent findings

- 'Radiology reports should ensure that critical findings are emphasised and obvious and that the degree of urgency for action by the referring health professional is clear.'[1]
- 'Defining and developing a policy for radiological imaging reports which require particularly timely and reliable communication; for example, abnormal, unexpected and/or critical ranges.'[1]
- 'Define and document 'safety net' procedures; for example, copy reports to the GP, cancer services multidisciplinary team or other identified health professional in consultation with the referring health professional.'[1]

4. Standards and responsibilities for report and alert communication

Effective communication of radiology reports and fail-safe alerts requires co-operation between radiologists, radiology departmental management, referring clinical teams and trust management. All four groups should work collaboratively to improve patient safety in the communication of radiology reports. The individual responsibilities are defined below.

Standards and responsibilities that apply to radiologists

- Radiologists should ensure that the reports are timely, clear and precise, and the urgency for action is clearly documented within the content of the report.
- Radiologist should clearly document advice on further management or action, where appropriate.
- Radiologists should have a clear understanding of agreed local policies and workflow process for fail-safe alert communication.
- Radiologist should flag a report which has urgent, critical, significant, unexpected and actionable findings, which he/she feels may not be acted upon in a timely manner.
- Radiologist should inform verbally (by telephone) the appropriate referring clinician/team of an unexpected acute life- or limb-threatening finding which requires emergency clinical action. He/she should document that this was done, (when and to who) within the radiology report or via an addendum.
- Radiologists working for teleradiology providers should make themselves aware of the local fail-safe alert policies of the referrers' institutions and should adhere to them.

Standards and responsibilities that apply to radiology departments

- Every radiology department should define and develop safety nets for the communication of critical, urgent and unexpected significant findings. This is outlined in the NPSA SPA16 (Appendix 1).[1] These are also known as fail-safe alerts.
- Each radiology department should have a robust policy on how fail-safe alerts will be communicated and notified, formally agreed with the referring teams. Push notification of fail-safe alerts can either be by:
  - Electronic means: communication HL7 messaging in the observation [OBX] segment field 8 to EPR, and then push notification from EPR to smartphones/email
  - Manual process: telephone, fax, email and so on.

  (Both electronic and manual processes may be required until such time that the NHS becomes fully paperless.)
- Radiology departments should ensure the radiology information system (RIS) or other radiology reporting application used by the department is capable of communicating fail-safe alerts electronically to the hospital-wide radiology report reading and tracking systems, such as EPR and GP systems and PACS, using standard messaging (HL7 ORU [OBX] segment field 8).

- If manual fail-safe notification processes are being used, the radiology department should ensure that the RIS or other radiology reporting application is able to produce a worklist of all exams that have been flagged by radiologists. This fail-safe worklist should be available to the clerical staff who have been tasked with contacting the clinical team.
- If manual notification processes such as telephone calls, faxes and so on, are required for communication of fail-safe alerts to referring teams, radiology departments should ensure radiologists are supported at all times of day or night by clerical or administrative staff. Clerical staff would be required to communicate to the referring team the existence of a fail-safe alert report for the particular patient (on PACS, EPR or GP system), which needs urgent review by a doctor.
- Clerical supporting staff should document within the RIS or the radiology reporting application, the details of the person contacted and the time and date of the communication of the fail-safe alert.
- Teleradiology providers sub-contracted by NHS radiology departments should adhere to the same local fail-safe alert policy. This should be agreed as part of the contract.

Standards and responsibilities of the referring team

- Referring doctors should read and act upon the result of every investigation requested by the team.
- Referring doctors should have a clear workflow and policy on how to regularly access and read reports on imaging studies that they have requested.
- Referring teams should keep an audit trail of when these results are read and when they are acted upon.
- The clinical teams should have a robust mechanism for handover of urgent imaging reports, and for handover of pending urgent imaging study requests, to ensure that all significant imaging findings are acted upon by the clinical team in a timely manner, regardless of which clinical staff are actually on duty.
- Clinical teams should carry out regular audit to ensure they have read and acted upon all imaging study reports they have requested.
- Referrers should have a clear understanding of the locally agreed fail-safe alert policy within the trust (digital or manual) and act upon all fail-safe alerts in a timely manner.
- If push notifications are used for fail-safe alerts to smartphones, email and so on, it is the responsibility of the clinical teams to configure the IT system which generates the push notifications. Configurability means the ability to define who should receive the push notifications, on what day of the week, at what time and for which type of patient. The referring (responsible) consultants should be able to configure who should receive alerts for 'their' patients – for example, when they are not on-call, when they are on holiday and so on (without needing to ring the IT helpdesk), constituting an electronic handover process of alerts.

Standards and responsibilities of the trust/organisation

- Trusts should define and develop fail-safe alert policies for the communication of critical, urgent, significant and unexpected significant findings within radiology reports. This should be agreed by both the radiology department and the referring clinical teams – as outlined by NPSA SPN 16 (appendix 1).[1]
- Trusts should provide referring doctors with robust IT systems for electronic tracking, reading and acknowledgment of radiology reports in the full clinical context (one-click access to EPR, PACS and so on).
- Hospital-wide IT systems for tracking radiology reports should be capable of receiving and displaying fail-safe alerts via OBX:8 in the HL7 ORU message.
- If fail-safe alerts are communicated via 'push notifications' to doctors' smartphones, email or fax machines, it is the responsibility of the trust to provide IT applications, which are highly configurable for digital communication of push notifications.

Doctors should be able configure the system for 'electronic handover' of investigations for fail-safe alert notification to the appropriate on-call doctor and so on.

- The trust should carry out regular audits to ensure that radiology results are being read and acted upon in a timely manner.

Standard 1

All radiological reports should be produced, read and acted upon in a timely fashion, best to serve the patients' needs.

Standard 2

It is the responsibility of the radiologist to produce reports as quickly and efficiently as possible, and to flag reports when they feel a fail-safe alert is required.

Standard 3

It is the responsibility of employing organisations to ensure appropriate reporting and fail-safe systems are in place and to audit regularly (see suggested audit template in Appendix 2).

Standard 4

It is the responsibility of employing organisations/ radiology departments to ensure that reports can be communicated to other IT systems using HL7 standards (data items included in Appendix 3).[5]

Standard 5

It is the responsibility of the requesting doctor and/or their clinical team to read and act upon the report findings and fail-safe alerts as quickly and efficiently as possible.

Standard 6

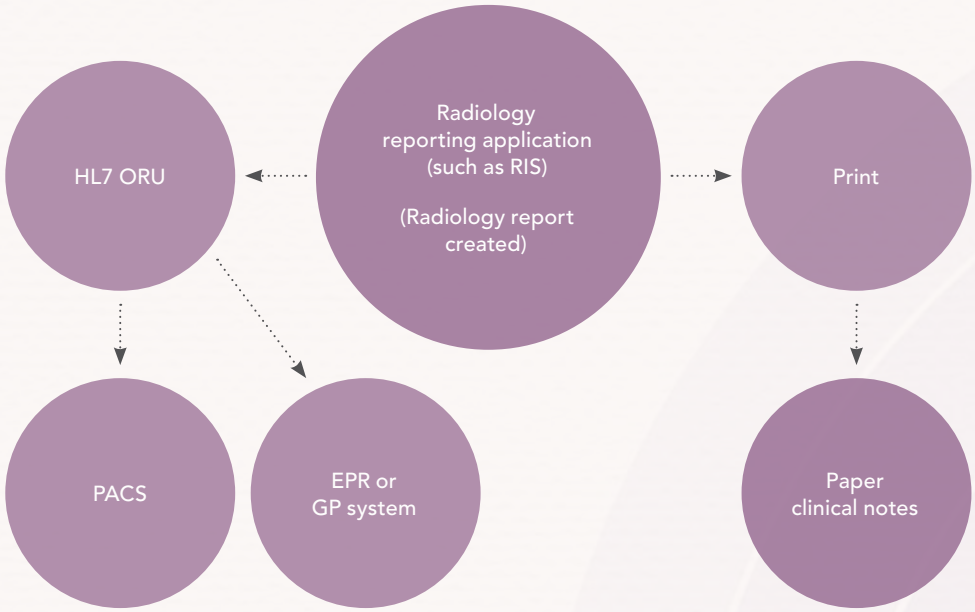
It is the responsibility of employing organisations to provide IT systems whereby, as soon as a verified imaging report has been produced, it is easily available for tracking by clinical teams. All reports should be read and acted upon by the referrer, their team and/or other relevant clinicians, with a permanent audit trail of who has read the report and who has taken responsibility for acting upon it.

Standard 7

Efficient and effective electronic means of fail-safe alert notification require investment by trusts. Until there are robust systems of tracking and notification within electronic patient record (EPR) systems, manual processes via telephone, email or fax will continue to be required. Patient safety should remain the most important aspect in this process.[6]

5. Technology for communication of radiology reports

Flowchart for radiology report communication



Technology plays a huge role in the communication of radiology reports. By offering radiologists a better understanding of the technology that underpins reporting systems, it is hoped that this document will help them to influence the procurement process and ensure that the necessary support systems are implemented.

Radiology reports are created in radiology reporting applications. This is predominantly the RIS in NHS hospitals, but reporting applications can be part of the PACS or even the EPR. Increasingly radiology reports are also being produced in teleradiology platforms.

Radiology reports are transmitted electronically via an HL7 ORU message from the radiology reporting application to IT systems such as PACS, EPR and GP systems, where reports are read by clinicians. Radiology reports also continue to be printed to be attached to paper notes within many NHS hospitals as the NHS is not yet fully paperless.

IT systems that maybe used for reading, tracking and acknowledging radiology reports should be part of EPR or have one-click access to the hospital EPR and GP systems.

It is essential that consultants and GPs read and acknowledge radiology reports in the context of comprehensive clinical information (blood results, histopathology, endoscopy results, clinic letters and discharge summaries and so on) for that patient. This is vital in ensuring correct identification of the patient. Merely having a report attached to a patient name can be meaningless, especially when the referrer makes numerous imaging requests in his/her everyday practice. This is important for patient safety in results acknowledgement.

It is crucial that, whether communicated in hard copy or electronically to PACS, EPR or GP systems (via HL7 ORU messaging), the reporting application should communicate the full information about the primary reporter (in observation request [OBR:32]) and the secondary reporter (if one is present, in OBR:33).

Information that should be included in the report

- National ID – General Medical Council (GMC) number for the radiologists (OBR32.1)
- Full name of the reporter (OBR:32.2 and 32.3)
- Job role as defined by the NHS Data Dictionary (OBR:32.5) this will usually be consultant, specialist registrar or radiographer: diagnostic, specialist practitioner[11]
- Main specialty as defined by the NHS Data Dictionary (OBR:32.7), this will normally be radiology code 810.[11]
- The reporter's employing institution (OBR:32.9) whether NHS trust or independent provider, for example, teleradiology provider and so on.[11]

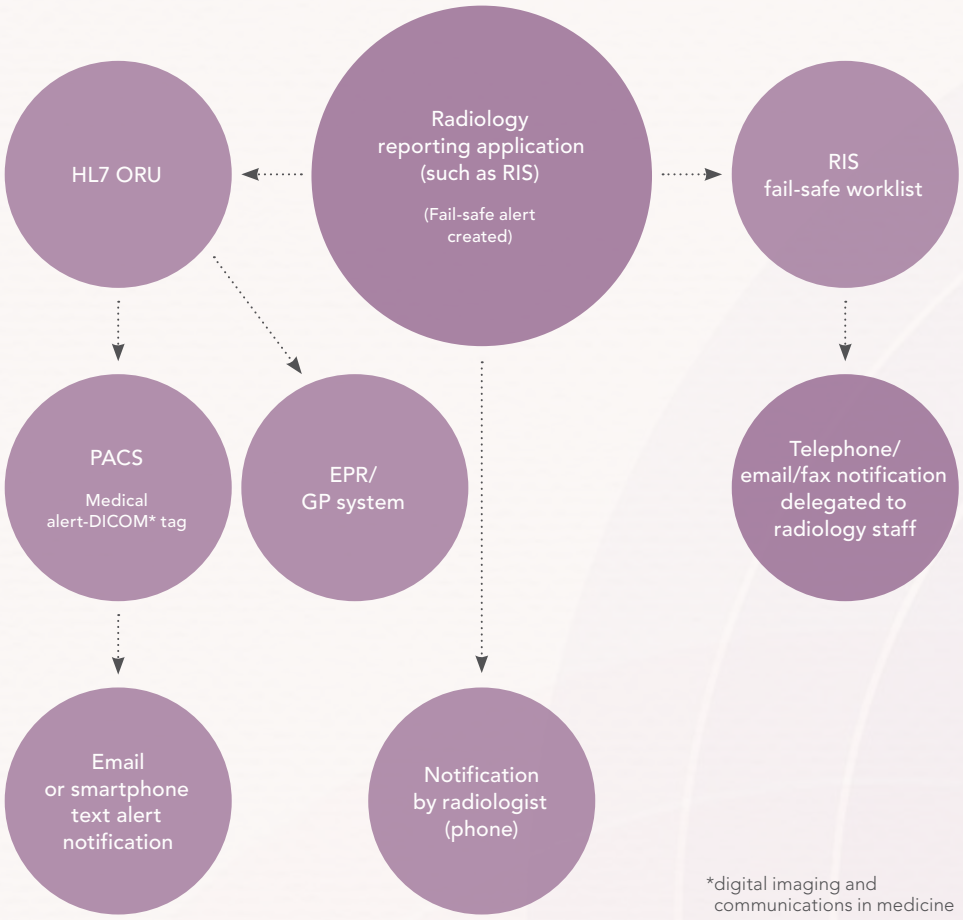
They should use consistent NHS data dictionary terms to identify the qualifications and job-roles of the reporter.[11] It is essential for the referrer to understand the level of qualification and the experience of the author of the report to understand what emphasis to put on the report. This is important for patient safety in communication.

Standard 8

Fail-safe systems should be IT based to reduce error and increase efficiency, but if facilities are not available, alternative manual processes should be in place.

6. Technology for the communication of fail-safe alerts

Flowchart for fail-safe alert communication and notification



*digital imaging and communications in medicine

Technology also plays a huge role in communication of fail-safe alerts which may be added to a radiology report.

Radiologists may add a fail-safe alert, where appropriate, to the normal report communication.

As suggested in section 2, fail-safe alerts can be communicated by:

- Electronic means (using HL7 messaging)
- Manual processes (telephone communication, email, fax and so on).

Currently, most NHS trusts use both mechanisms as most NHS hospitals still rely on paper clinical notes for a comprehensive clinical record and electronic processes for fail-safe alert notification may not be considered to be reliable and dependable enough.

The radiologist can create a fail-safe alert by clicking a 'fail-safe alert flag' on the radiology reporting application. The alert should be sent out as an abnormal flag as part of the radiology report in the HL7 ORU message (abnormal flag in OBX segment field 8). This abnormal flag should be received and displayed by IT systems used for reading and acknowledging reports, such as hospital EPR or GP systems. PACS should also be able to display fail-safe alerts. On the reading and acknowledging IT applications (whether these be the hospital EPR or GP systems), the consultant or GP should be able to create a worklist of all reports (based on referring responsible consultant/GP), and also be able to filter out the fail-safe alert reports – that is, reports with an abnormal flag (so that they can deal with them before the others).

The fail-safe alert should also be displayed in PACS on the digital imaging and communications in medicine (DICOM) tag – 0010, 2000 called medical alert. Clinical users should also be able to filter the PACS for the fail-safe alerts. However, referrers would need to access the PACS/EPR to access the fail-safe alert sent list using 'pull/query technology.'

Fail-safe alert communication can be supplemented with digital 'push notification' to the referrer's smartphone or email address. However, care should be taken that if such push notification technology is used, the responsibility to configure the push notification application remains with the referring team. Referring teams should also be responsible defining to who the notification should be sent, the method of push notification (SMS or email etc) and the type of patient that push notifications should be sent for.

For example, for accident and emergency and inpatients, push alerts maybe sent to the on-call/emergency shift doctor's smartphone/bleep for each individual patient, whereas for outpatients and GP referrals, alert notifications may be sent at a particular time of day (for example 9 am and 4 pm) simply informing the consultant/GP/medical cover that there are a number of alerts waiting for his/her review. The 'push notification' application should be highly configurable in terms of the person to who the notification should be sent, and at what time/on which day (weekend, weekday). The push notification application should take account of consultant leave, rota arrangements and so on, and the type of patient being investigated. It is important that if push notifications are sent to personal devices such as smartphones, no patient identifiable data are transmitted. The alert may simply say 'Radiology report alert – please review PACS or EPR.'

Manual processes for 'notification' of fail-safe safe alert communication require telephone calls, emails or faxes being sent to the referrer or multidisciplinary team (MDT) co-ordinator and so on. Notification by telephone may be performed by the radiologists themselves or delegated to clerical/administrative staff within the radiology department, where appropriate. For life- or limb-threatening fail-safe alerts, the radiologists should make the telephone notification themselves. However, for non-critical alerts, the task maybe delegated to radiology clerical staff.

Where the fail-safe notification is delegated to radiology clerical staff, the radiology reporting application would send the exams to a fail-safe worklist within the application (usually RIS). Radiology clerical staff would have access to the 'fail-safe alert worklist' of reports on RIS, and they can make the fail-safe communication telephone call to the relevant consultant's secretary, GP surgery or MDT co-ordinator as advised by the radiologist. Within the RIS, clerical staff should be required to document when they communicated the alert and to who.

There should be a robust audit trail. Ideally, radiologists should not be required to spend time chasing clinicians and secretaries unless the communication relates to a life- or limb-threatening unexpected finding. Radiologists should be supported by clerical/administrative staff 24/7 to provide fail-safe communication on their behalf, particularly if manual processes of fail-safe notification are required.

RIS and other radiology reporting applications should continue to support both methodologies (electronic and manual processes) for fail-safe alert communication and notification, until such time that the NHS is fully paperless and there are robust systems for tracking and notification of fail-safe alerts within EPR systems.

Standard 9

If manual processes (for example, telephone calls, emails, faxes and so on) are required to support the fail-safe process, clerical/administrative staff should be available to support radiologists at all times of the day or night.

Standard 10

These standards apply to all investigating units, including NHS hospitals, independent sector services and teleradiology reporting providers.

Approved by the Board of the Faculty of Clinical Radiology: 26 February 2016.

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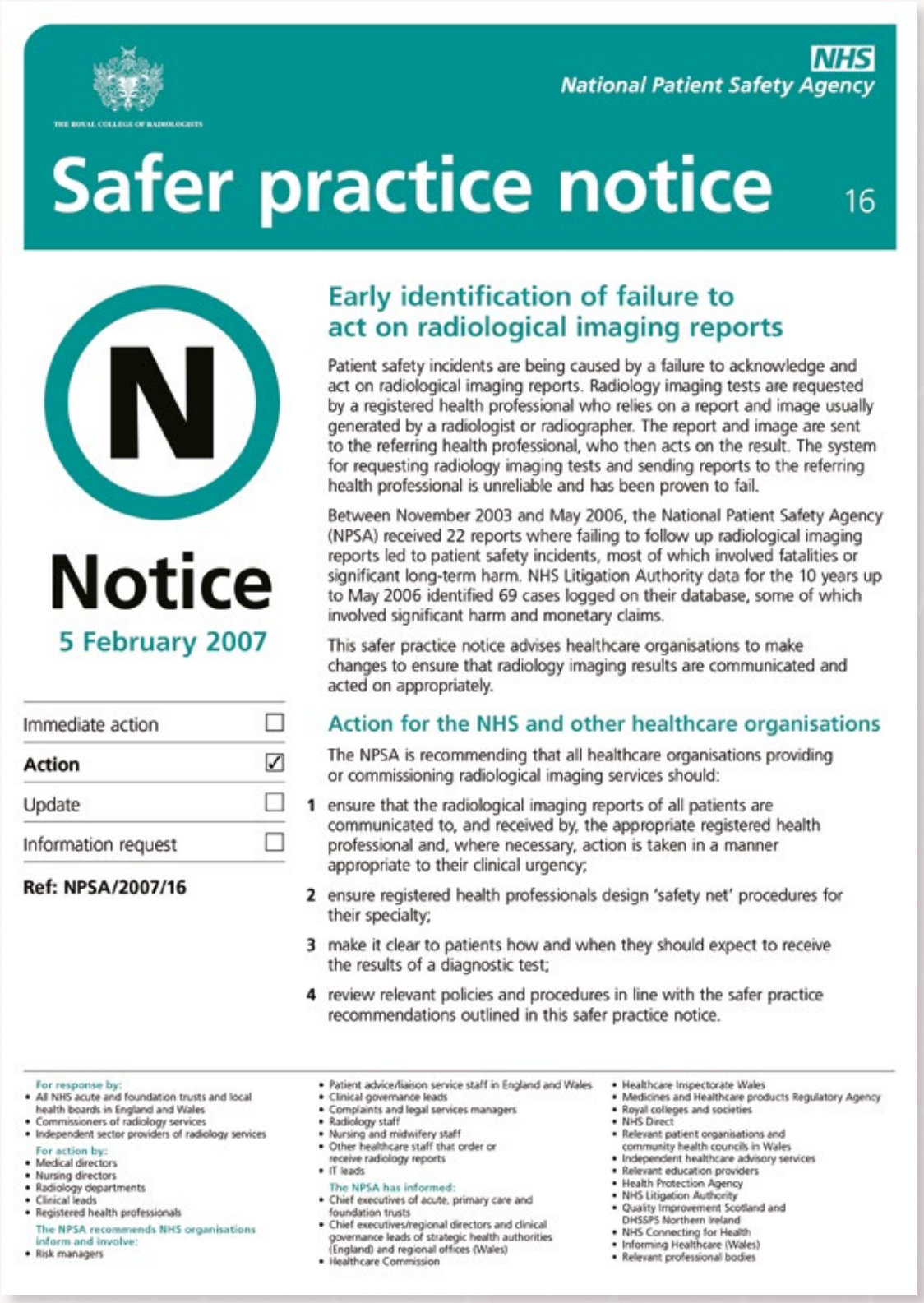
Appendix 1.



THE ROYAL COLLEGE OF RADIOLOGISTS

NHS
National Patient Safety Agency

Safer practice notice 16

N

Notice

5 February 2007

Immediate action	☐
Action	☑
Update	☐
Information request	☐

Ref: NPSA/2007/16

Early identification of failure to act on radiological imaging reports

Patient safety incidents are being caused by a failure to acknowledge and act on radiological imaging reports. Radiology imaging tests are requested by a registered health professional who relies on a report and image usually generated by a radiologist or radiographer. The report and image are sent to the referring health professional, who then acts on the result. The system for requesting radiology imaging tests and sending reports to the referring health professional is unreliable and has been proven to fail.

Between November 2003 and May 2006, the National Patient Safety Agency (NPSA) received 22 reports where failing to follow up radiological imaging reports led to patient safety incidents, most of which involved fatalities or significant long-term harm. NHS Litigation Authority data for the 10 years up to May 2006 identified 69 cases logged on their database, some of which involved significant harm and monetary claims.

This safer practice notice advises healthcare organisations to make changes to ensure that radiology imaging results are communicated and acted on appropriately.

Action for the NHS and other healthcare organisations

The NPSA is recommending that all healthcare organisations providing or commissioning radiological imaging services should:

1 ensure that the radiological imaging reports of all patients are communicated to, and received by, the appropriate registered health professional and, where necessary, action is taken in a manner appropriate to their clinical urgency;

2 ensure registered health professionals design 'safety net' procedures for their specialty;

3 make it clear to patients how and when they should expect to receive the results of a diagnostic test;

4 review relevant policies and procedures in line with the safer practice recommendations outlined in this safer practice notice.

For response by:
- All NHS acute and foundation trusts and local health boards in England and Wales
- Commissioners of radiology services
- Independent sector providers of radiology services

For action by:
- Medical directors
- Nursing directors
- Radiology departments
- Clinical leads
- Registered health professionals

The NPSA recommends NHS organisations inform and involve:
- Risk managers
- Patient advice/liaison service staff in England and Wales
- Clinical governance leads
- Complaints and legal services managers
- Radiology staff
- Nursing and midwifery staff
- Other healthcare staff that order or receive radiology reports
- IT leads

The NPSA has informed:
- Chief executives of acute, primary care and foundation trusts
- Chief executives/regional directors and clinical governance leads of strategic health authorities (England) and regional offices (Wales)
- Healthcare Commission
- Healthcare Inspectorate Wales
- Medicines and Healthcare products Regulatory Agency
- Royal colleges and societies
- NHS Direct
- Relevant patient organisations and community health councils in Wales
- Independent healthcare advisory services
- Relevant education providers
- Health Protection Agency
- NHS Litigation Authority
- Quality Improvement Scotland and DHSSPS Northern Ireland
- NHS Connecting for Health
- Informing Healthcare (Wales)
- Relevant professional bodies

Safer practice notice 16

Early identification of failure to act on radiological imaging reports

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Action deadlines for the Safety Alert Broadcast System (SABS)

Deadline (action underway): 28 April 2007
Action plan to be agreed and actions started

Deadline (action complete): 28 February 2008
All actions to be completed

Further information about SABS can be found at
www.info.doh.gov.uk/sar2/cmopatie.nsf

National Reporting and Learning System data

A review of data from the NPSA's National Reporting and Learning System (NRLS) between May 2006 and October 2006 indicated a significant rise in reporting rates, which may have been connected to publicity about this project. During this period, 31 incidents were reported of which the outcome for the patient was severe in eight cases and moderate in nine, with the remaining cases resulting in low or no harm.

Recommendations for action

Recommendations for action by referring registered health professionals

- Ensure your name and/or code is clearly identified on the request form along with an adequate clinical history and reason for the radiology image.
- Ensure systems are in place to provide assurance that requested images are performed, (or alternatively that the request has been assessed by the radiology department as unjustified) and the results of these are viewed, acted upon accordingly and recorded. It is the referring registered health professional's responsibility to ensure this is followed.
- Ensure your specialty or disease group designs a 'safety net' procedure in case these systems fail. This is particularly important in accident and emergency departments and assessment areas.
- Always access electronic systems using your allocated log-on and, if acknowledgement functions for the receipt of results or reports exist, use them.
- In the absence of electronic tracking systems, adopt hard copy tracking systems such as ward books or results acknowledgement sheets.
- When using hard copies of reports, ensure they are reviewed, signed, timed and dated, and any clinical decision noted before filing in patients' records.
- Inform patients of all results, positive or negative, and document that this has been done. A standard letter to patients could be an additional safety mechanism.
- If a patient's radiology imaging report is not available at the time of accident and emergency attendance, in-patient discharge or out-patient consultation, check the results as soon as possible and ensure the patient is informed of them. Patients may be informed through standard letters, phone calls or other appropriate means.
- Ensure patient information and contact details are correct and clear.
- Provide patients with details of when test results are expected and how they will be communicated, giving contact details for enquiring about any concerns or delays.
- Audit your communication tracking systems to ensure compliance with these recommendations.

Appendix 2. Audit template for communication of fail-safe alerts

This audit provides evidence on clinical effectiveness

Organisation and delivery

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

The cycle

1. The standards

- Every department should have a defined process for the communication of fail-safe alerts as outlined by Safer Practice Notice 16 (appendix 1).[1]
- The processes involved should be transparent and form clear and available trust policy, agreed between the radiology department and requesting clinicians.
- The processes involved should be subjected to regular audit.
- There should be defined fail-safe alert procedures for significant unexpected findings – such as unexpected cancer on imaging. Processes involved may include copy reports to the GP, cancer services multidisciplinary team or other identified healthcare professional in consultation with the referring healthcare professional.

2. The indicators and targets

Flagging of radiology findings that need a fail-safe alert in a report: target 100%

Electronic communication of fail-safe alerts to PACS, EPR and GP systems: target 100%

Manual process for communication of fail-safe alert (if used): target 100%

3. Assess local practice

Data collection requirements. Choose a site-specific cancer (for example, lung) or other agreed pathology and determine whether alerts were appropriately used and issued. For example, for lung cancer, ask for a list of all new cases of newly diagnosed lung cancer from the lung MDT for the past three months, including the date of diagnosis. Review all the radiology reports prior to the diagnosis to assess whether the reports have been flagged with a fail-safe alert within the radiology report text.

Review all reports on EPR or PACS to see if the fail-safe alert has been transmitted electronically via OBX:8.

Review the report information and RIS or radiology reporting application information to look for manual fail-safe processes documentation – for example, that a copy of the report was sent to the MDT co-ordinator, the report was telephoned and so on.

4. Resources needed

- Personnel: IT facilities and clerical time to pull the necessary lists.
- Time: allow eight hours per year for scrutinising records and preparing formal annual reports.

Appendix 3. Radiology report metadata content

Whether hard copy or electronic, the radiology report should contain the following data items:

1. **Patient demographics**
   a. Name
   b. Date of birth
   c. Sex
   d. Address
   e. Patient administration system (PAS)/electronic patient record (EPR) number
   f. NHS number
2. **Patient location at request**
   a. Location description: ward name etc
   b. Location type: A&E, inpatient, outpatient and GP
3. **Requesting responsible consultant/GP**
   a. ID – General Medical Council (GMC) number
   b. Name
   c. Job role as defined by the NHS Data Dictionary[11]
   d. Main specialty as defined by the NHS Data Dictionary[11]
   e. Employing institution as defined by the NHS Data Dictionary[11]
4. **Unique numbers**
   a. Accession number = unique scheduling number issued by RIS
   b. Order number = Unique number issued by Ordercomms/electronic requesting system (RIS for paper requests)
5. **Reporter (primary +/- secondary)**
   a. ID – GMC number
   b. Name
   c. Job role of reporter as defined by the NHS Data Dictionary[11]
   d. Main specialty as defined by the NHS Data Dictionary[11]
   e. Employing institution as defined by the NHS Data Dictionary[11]
6. **Appointment date or study date (when exam was performed)**
7. **Exam room and institution which owns the machine where the image acquisition took place (mobile scanners should be identified)**
8. **Date and time of primary report authorisation**
9. **Additional dates for corrections and report addenda if issued should also be included**
10. **Priority: urgent, 2 week wait, routine**
11. **Patient category: NHS, private, category II (medico-legal)**
12. **Modality: computed radiography (CR), computed tomography (CT), magnetic resonance imaging (MRI) and so on**
13. **Exam description: using national exam codes and description**
14. **Where/to who copies of reports were sent (if reports need to be sent to someone other than referrer)**
15. **Report type**
    a. Primary report
    b. Addendum
    c. Corrected primary report
    d. Corrected addendum
16. **Fail-safe alert**
    a. No alert
    b. Alert present
17. **Narrative report text**

Appendix 4. Glossary of terms

Health Level-7 or HL7 refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers – including radiology information systems (RIS) applications.

Digital imaging and communications in medicine (DICOM) is a standard for handling, storing, printing and transmitting information in medical imaging. It includes a file format definition and a network communications protocol. It applies predominantly to imaging data.

HL7 ORM message is a general order message that is used to transmit information about an order (electronic request). An order can be defined as a 'request for service' that is sent between healthcare information technology (IT) applications.

HL7 ORU message is an observation result message (ORU): it provides clinical observations. Clinical observations can include: clinical laboratory results, reports of imaging studies (that is, text), electrocardiogram (ECG), pulmonary function studies and so on.

Common order (ORC) segment in an HL7 message is used to transmit fields that are common to all orders (all types of services that are requested). The ORC segment is required in the order (ORM) message.

Observation request (OBR) segment transmits information about an exam, diagnostic study/observation or assessment that is specific to an order or result. It is used most frequently in ORM (order) and ORU messages.

Observation (OBX) segment is primarily used to carry key clinical observation/results reporting information within report messages, which should be transmitted back to the requesting system, to another physician system (such as a referring physician or office practice system) or to an archival medical record system.

Radiology information system (RIS) is a software application for recording and managing medical imaging and associated data. A RIS is especially useful for tracking the receiving, vetting, scheduling and completing radiology imaging orders in the NHS.

Picture archiving and communication system (PACS) is a healthcare technology for the short- and long-term storage, retrieval, management, distribution and presentation of medical images.

The definition of electronic patient record (EPR) in the NHS is an electronic record of periodic healthcare of a single individual, provided mainly by one institution.

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