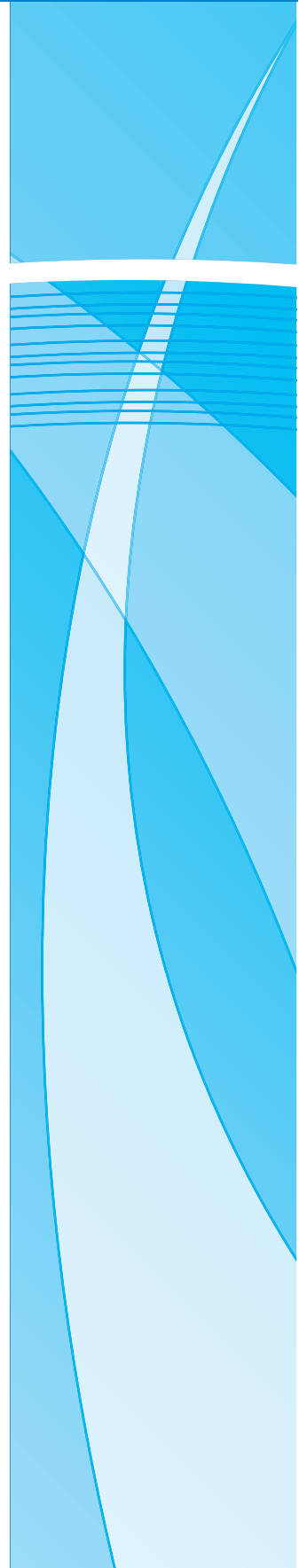


Standards for providing a 24-hour interventional radiology service



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.

Current standards documents

Standards for the communication of critical, urgent and unexpected significant radiological findings

Standards for Self-assessment of Performance

Standards for Radiology Discrepancy Meetings

Standards in Vascular Radiology

Standards for Ultrasound Equipment

Standards For Iodinated Intravascular Contrast Agent Administration To Adult Patients

Standards for Patient Consent Particular to Radiology

Standards for the Reporting and Interpretation of Imaging Investigations

Cancer Multidisciplinary Team Meetings – Standards for Clinical Radiologists

360° Appraisal – Good Practice for Radiologists

Individual Responsibilities – A Guide to Medical Practice for Radiologists

Contents

Foreword	4
Introduction	5
Recommendations for individual departments and trusts	6
Recommendations for individual radiologists	7
Implementation of standards	8
Models of safe interventional radiology provision	9
References	10
Appendix 1. Safe interventional radiology service provision	11
Appendix 2. Audit template	12
Appendix 3. Checklist for safe IR service provision	13

Foreword

For the safety of patients, it is necessary that acute hospital trusts have formal and robust arrangements to ensure provision of emergency services 24 hours a day every day, of the year. The provision of interventional radiology is no exception and all patients regardless of geography and hospital size should have access to interventional techniques if required. Several surveys have shown that this is not currently occurring. The majority of radiology departments report either no interventional on-call rota or informal arrangements without adequate resource. This suggests that there is an unmet need for intervention in many hospital trusts. In addition, only a small number of radiology departments report formal lines of referral to other trusts which can provide interventional radiology services on a full-time basis. Such unclear arrangements are a potential risk to patients and put unfair pressure on individual radiologists and certain hospital trusts. There needs to be clarity about the services that can and cannot be offered by individual departments and clear pathways for referral if we are to develop a better resourced and collaborative national interventional radiology service.

The emphasis of this document is to encourage trusts to:

- Put patient safety first, recognising the essential role of interventional radiology in the provision of modern medical care
- Recognise the resources and manpower required to provide an interventional radiology service
- Be clear and transparent regarding the local provision of interventional radiology services
- Decide what is, and what is not possible to provide in and out of hours
- Enter into discussions with strategic healthcare authorities, primary care trusts and other trusts in the region to make arrangements which ensure robust and coherent regional interventional radiology service provision 24 hours a day, seven days a week.

This standard is intentionally brief. It clarifies which services patients should have access to and suggest potential solutions to ensure 24-hour interventional radiology cover. It is stressed from the outset that the provision of appropriate diagnostic imaging is vital to the success of interventional radiology.

Introduction

The demand for all types of radiological imaging and intervention on a 24-hour, seven days a week basis has increased significantly in recent years. The term '24-hour radiological imaging services' applies equally to elective and acute services.

Interventional techniques are now at the forefront of management of many life-threatening emergencies (Table 1).

Every acute trust has a duty to ensure that there are formal arrangements to secure provision of elective and emergency interventional radiology services.¹ Several surveys have shown that this is not occurring.³⁻⁷ Fewer than 10% of hospitals are currently providing 24-hour interventional services due to insufficient resource. **This situation puts patients at risk.**

Table 1. Management of emergencies using interventional techniques

Situations where urgent or emergency interventional radiology is indicated
Stopping haemorrhage (eg, trauma, gastrointestinal (GI) bleeding, post-partum haemorrhage ^{8,9})
Thoracic aortic aneurysm, traumatic dissection and the complications of Type B dissection, ruptured peripheral aneurysms
Acute peripheral and visceral ischaemia
Managing sepsis secondary to upper urinary tract and biliary obstruction (often urgent though rarely an emergency)
Draining intra-abdominal and intra-thoracic abscess (often urgent, though rarely an emergency)
Colonic stenting (often urgent, though rarely an emergency)
Image-guided intervention in subarachnoid haemorrhage
Situations where emergency interventional radiology might be indicated in future
Emergency management of abdominal aortic aneurysm ⁵
Stroke

Recommendations for individual departments and trusts

The following issues should be addressed.

1. Recognition that in the absence of provision of IR services patients will be placed at risk.^{1,5–10}

There should be exploration of ways in which a comprehensive service may be offered by internal reorganisation, maintenance of core skills, additional funding/training/appointments, or external networking.

Discussion should take place with the clinical governance department about the implications of a lack of 24-hour access.

2. There should be clarity within the trust and among referring clinicians and service commissioners about what interventional radiology services are available and when they are available.

If a service is not available at all, within or outside routine working hours, for example, embolisation for acute haemorrhage, this should be known to the clinical governance committee. Where there is an unmet clinical need, discussions can take place with commissioners about purchasing appropriate services from another trust.

3. Clear pathways should be in place for treating patients appropriately when the interventional radiology service is not available.

The trust's clinical governance committee and relevant referring clinicians need to be aware of the situation. This will allow discussion about planned patient pathways when the service is not available, for example, default to surgical treatment, and also document an area of possible need for service development.

4. Out-of-hours service provision must be subject to a formal rota.

It is not sustainable, safe or timely to rely on 'ad hoc' methods of trying to find a suitable radiologist who is not officially on call. Nor is it acceptable to assume that another trust will be willing or able to provide the service without official and agreed service level agreements.

A mechanism should be in place for informing clinical teams in advance about when services will and will not be available, so that all involved are clear about when alternative non-radiological treatments or referral will be required.

5. There should be recognition of the resource implication of supporting a 24-hour interventional service in terms of diagnostic imaging and manpower.^{11–14}

Appropriately trained radiographers and nurses are required to support a full-time interventional radiology service as are CT and ultrasound facilities.

6. Onward referral pathways must be clear.

When a service is not provided on a 24-hour basis, and when this usually results in patients being transferred to other trusts, this pattern of referral requires clarification with the clinical governance committees and agreement on the part of the receiving trust.

It is not sufficient to assume that another trust will accept patients without such agreements. When there is a clinical need for a service on a routine or emergency basis but this cannot be provided locally and patients are transferred elsewhere:

- a. Formal contractual agreements should be in place with any trust to which patients are transferred
- b. Protocols should be in place describing the arrangements for transfer
- c. Transfer must be in a timely fashion
- d. Arrangements for appropriate funding need to be in place.

Recommendations for individual radiologists

1. **All doctors are bound to adhere to General Medical Council (GMC) guidance and must comply with the principles and values set out in GMC Good Medical Practice.¹³**

When a radiologist who is designated to be on call is consulted about a patient, it is incumbent on that individual to advise the clinical team appropriately, even if they are unable to carry out the requested examination/procedure themselves.

This may include advice on alternative imaging/treatment or transfer to the agreed alternative provider.

2. **Radiologists should not normally carry out procedures with which they are unfamiliar.^{1,12}**

Previous guidance from The Royal College of Radiologists (RCR) has indicated that a radiologist should not carry out, at night, an investigation or treatment that they do not carry out during the day.¹⁵ If a service is required on a reasonably regular basis then individual radiologists must maintain the necessary skills. Inevitably, there will be a risk-benefit analysis in any individual case. The risks of transfer of the patient,^{16–18} the presence or absence of any alternative therapies, and the experience of the radiologist will all need to be taken into account.

If it is agreed among all the doctors involved that because of difficulties, or danger of transfer or delay, it is in the best interests of the patient to be treated by a less experienced radiologist locally, the situation should be made clear to the patient (and/or their relatives if appropriate) and informed consent obtained.

3. **Radiologists should recognise that ad-hoc on call rotas are not in the best interest of patients.¹⁴**

This form of service provision is unsatisfactory and may conceal a lack of safe, robust and reliable service provision. Formal interventional radiology rotas should be supported by appropriate nursing and radiographic staff.

There must be a safe environment for performing the procedure, including patient monitoring and anaesthetic help when required together with liaison with the appropriate clinical team.

4. **It is the duty of the radiologist to report any risk management concerns to the trust's clinical governance committee.¹⁴**

This applies when a radiologist has concerns regarding any aspect of the provision of the radiology service.

Implementation of standards

Departmental leads should ensure the following.

1. Local agreement is reached among radiologists in clinical departments about what services are provided on call.¹⁴ Discussion about maintenance of and definition of what constitutes 'core' radiological skills among local radiologists and how these may be maintained should take place. Attendance at relevant continuing medical education (CME) courses such as those provided by the British Society of Interventional Radiology and the RCR is advisable and it may be necessary to update practical skills by spending time in larger departments.
2. There is agreement with clinicians on treatment/alternative imaging pathways when a particular aspect of the imaging/interventional service is not available.
3. There is a mechanism for information to be available to clinicians on a daily/weekly basis about when services are/are not available.
4. Formal contracts exist with other trusts to which patients are transferred for imaging or intervention.
5. Locally agreed protocols and/or guidelines for referral for emergency imaging/intervention have the potential to reduce confusion and/or disagreement in individual cases. These protocols should be evidence-based and have been agreed with the local clinical governance committee and the relevant clinical teams.
6. Individual radiologists, in conjunction with clinical leads or their appraiser, should keep their range of skills and routine practice under review, with the aim of balancing subspecialty expertise with the maintenance of core skills needed to provide a trust-wide emergency radiology service (see 1 above).

Models of safe interventional radiology provision

Interventional radiology is a 'small specialty'; in other words, there is insufficient elective work in many hospitals to support the employment of sufficient interventional radiologists to provide a safe interventional radiology service during or outside working hours. The same problem pertains in many other specialties such as cardiothoracic surgery, interventional cardiology, neurosurgery, intensive care and so on. For these specialties, centralisation or networking have been the favoured solutions.^{18–20}

There is no single solution for provision of 24-hour cover, as geographical considerations may come into play. Collaboration can occur in a variety of local, sub-regional, regional or supra-regional forms.

When considering provision of safe interventional radiology services, there are three potential models of service provision (Table 2).

Table 2. Models for providing interventional radiology services

Model	Advantages	Drawbacks
Individual centres could each provide a safe interventional radiology service.	Maintains the status quo in the short term. Provides local service.	It has been recommended that doctors providing a consultant-delivered service should not be on call on a rota more onerous than 1:6. ²⁰ This may not be achievable or cost-effective.
Several centres could collaborate to develop a network to provide a safe interventional radiology service. a. Patient moves b. Interventional radiology moves	Utilises existing staff and facilities across several sites.	Depending on the model either doctors or patients transfer. Doctors might have to provide cover for several hospitals. Most doctors prefer to work in familiar surroundings where they understand the operational systems and know the equipment and staff.
Hub and spoke arrangement: Large specialist centres could provide services for a region on a full- or part-time basis.	Economy of scale of both staff and equipment. Simplifies provision of a robust resilient service in and out of hours. Depending on the model, allows maintenance and development of skills for interventional radiologists working in the periphery.	If the level of care was equivalent, most patients would prefer to be treated locally.

An additional possibility is for services to be developed on a regional basis and provided from large centres with doctors travelling to acute trusts for non-emergency and minor procedures but patients coming to the centre for emergency and complex procedures before returning to their local hospital to convalesce. In the context of a small service, this would improve provision of an interventional radiology service during periods of leave.

Approved by the Board of the Faculty of Clinical Radiology 2 March 2008

References

1. The Royal College of Radiologists. *Standards in vascular radiology*, 2nd edition. London: The Royal College of Radiologists, 2007.
2. West Yorkshire Chief Executive Forum and Strategic Health Authority. *Interventional Radiology in North and West Yorkshire*. Leeds: West Yorkshire Chief Executive Forum and Strategic Health Authority; 2005.
3. *Overview of Interventional Practice in the UK*. The Royal College of Radiologists, 2005. www.rcr.ac.uk/content.aspx?pageid=1562
4. *Update of interventional radiology services in the United Kingdom 2007*. The Royal College of Radiologists, 2007. www.rcr.ac.uk/content.aspx?pageid=1563
5. National Confidential Enquiry into Patient Outcome and Death. *Abdominal Aortic Aneurysm: A service in need of surgery?* London: NCEPOD, 2005.
6. National Confidential Enquiry into Patient Outcome and Death. *Trauma: Who cares?* London: NCEPOD, 2007.
7. National Confidential Enquiry into Patient Outcome and Death. *Emergency Admissions: A journey in the right direction?* London: NCEPOD, 2007.
8. Healthcare Commission. *Investigation into 10 maternal deaths at, or following delivery at, Northwick Park Hospital, North West London Hospitals NHS Trust, between April 2002 and April 2005*. London: Healthcare Commission, 2006. www.healthcarecommission.org.uk/_db/_documents/Northwick_tagged.pdf
9. The role of emergency and elective interventional radiology in postpartum haemorrhage RCOG Good Practice No. 6 June 2007
10. National Confidential Enquiry into Perioperative Deaths. *Interventional Vascular Radiology and Interventional Neurovascular Radiology. A Report of the National Confidential Enquiry into Perioperative Deaths*. London: NCEPOD, 2000
11. The Royal College of Radiologists. *Safe Sedation, Analgesia and Anaesthesia within the Radiology Department*. London: The Royal College of Radiologists, 2003.
12. The Royal College of Radiologists, The Royal College of Nursing. *Guidelines for Nursing Care in Interventional Radiology: The roles of the registered nurse and nursing support*. London: The Royal College of Radiologists, 2006.
13. General Medical Council. *Good Medical Practice*. London: GMC, 2006.
14. The Royal College of Radiologists. *Advice from the Royal College of Radiologists Concerning Training for Carotid Artery Stenting (CAS)*. London: The Royal College of Radiologists, 2006.
15. The Royal College of Radiologists. *Advice to clinical radiology members and fellows with regard to out of hours working*. London: The Royal College of Radiologists, 1996.
16. Cassar K, Godden DJ, Duncan JL. Community mortality after ruptured abdominal aortic aneurysm is unrelated to the distance from the surgical centre. *Br J Surg* 2001; **88**: 1341–1343.
17. Ham C. Reconfiguring acute hospitals in England. *BMJ* 2006; **333**: 1135–1136.
18. 'Saving' hospitals costs lives. Institute for Public Policy Research December 2006. <http://www.ippr.org.uk/pressreleases/archive.asp?id=2467&fID=173>
19. *The Report of the National Leadership Network Local Hospitals Project. Strengthening Local Services: The Future of the Acute Hospital*. London: National Leadership Network, 2006. <http://www.nationalleadershipnetwork.org/public/NLN-StrengtheningLocalServicesMain-170306.pdf>
20. The Vascular Society of Great Britain and Ireland. *The provision of emergency vascular services 2007*. London: The Vascular Society of Great Britain and Ireland, 2007 http://www.vascularsociety.org.uk/Docs/VSGBI%20Emergency_3.pdf

Appendix 1. Safe interventional radiology service provision

The items below identify the elements of a safe interventional radiology service. It is assumed that a department will be appropriately staffed for the safe performance of interventional procedures, including the availability of trained radiographers and radiology nurses.

Vascular diagnosis and intervention

Arterial diagnosis

- a. Interpretation of emergency CT, MR and ultrasound for the detection of vascular pathology.
- b. Mesenteric angiography.
- c. Trauma angiography.
- d. Peripheral angiography.

Arterial intervention

- a. Embolisation of haemorrhage: GI tract, urinary tract, trauma, bronchial, obstetric.
- b. Management of acute arterial ischaemia: peripheral, renal, visceral by angioplasty stenting thrombolysis and thrombus aspiration.
- c. Use of stent grafts for arterial/aortic rupture.
- d. Stenting and stent grafting for the complications of Type B aortic dissection.

Venous intervention

- a. Insertion of IVC filter.
- b. Mechanical pulmonary thrombectomy.
- c. Thrombolysis for phlegmasia caerulea dolens and massive ilio femoral DVT.
- d. Haemodialysis access: central venous catheter (CVC) fistula thrombolysis and thrombectomy.*
- e. TIPS for variceal haemorrhage.**

Non-vascular diagnosis and intervention

Many of the skills required in this area are core radiological skills and departments should ensure that there are sufficient numbers of radiologists to provide these services in and out of hours.

- a. **General:** image-guided drainage of abscess.***
- b. **Urological:** nephrostomy to drain infected PC system, insertion of suprapubic catheter.***
- c. **Hepatobiliary:** percutaneous drainage of infected biliary tree.***
- d. **Gastrointestinal:** colonic stenting.***

* Fistula salvage is not required as an out-of-hours intervention but may occasionally be required over weekends and bank holidays.

** It is recognised that even in large centres uncommon procedures may not be performed by all interventional radiologists hence such interventions may not be available 24/7.

*** It would be rare for these procedures to be required at night-time but they may be required urgently during the daytime at weekends.

Appendix 2. Audit template

Assessment of a department's provision of all aspects of a 24-hour interventional radiology service

The audit template can also be downloaded from www.rcr.ac.uk

Background

The demand for all types of radiological imaging and intervention on a 24-hour, seven day a week basis has increased significantly in recent years. The term '24 hour radiological imaging services' applies equally to elective and acute services.

Interventional techniques are now at the forefront of management of many life-threatening emergencies. Every acute trust has a duty to ensure that there are formal arrangements to secure provision of elective and emergency interventional radiology services.¹

The Cycle

The standard

- The interventional radiology service should be formally available 24 hours a day, every day of the year.
- Service is formally supported by an on-call rota for a named individual for each of the following groups: consultant radiologist, radiographer, interventional radiology nurse, anaesthetist when appropriate.
- Diagnostic imaging support such as CT is formally available 24 hours a day, every day of the year.
- Facilities and consumables are available for each of the services listed:
 - Vascular: arterial diagnosis, arterial intervention, venous intervention
 - Non-vascular: general, urological, biliary.

Target

100% compliance in all areas.

Assess local practice:

The indicator(s)

Affirmative answer to each question.

Data items to be collected

Questionnaire to be completed for each aspect of the service; that is, arterial diagnosis, arterial intervention, venous intervention, general, urological, biliary.

Suggestions for change if target not met

Any deficiency in service provision should be brought to the attention of the trust management. When not all services are available locally, departmental leads should ensure that:

- There is agreement with clinicians on alternative management pathways
- There is a mechanism for information to be available to clinicians about when services are not available
- Formal contracts exist with other trusts to which patients are transferred for intervention
- Locally agreed protocols for referral for emergency intervention have the potential to reduce confusion in individual cases. These protocols should be evidence-based and agreed with relevant clinical teams
- Individual radiologists should keep their range of skills and routine practice under review, with the aim of balancing subspecialty expertise with the maintenance of core skills needed to provide a trust-wide emergency radiology service.

Resources

Interventional imaging lead one hour to complete questionnaire and write up report and checklist for safe IR provision.

Appendix 3. Checklist for safe IR service provision

Performing this simple audit will quickly identify whether your IR service is safe. This should be performed for each of the services specified in Appendix 1.

1. Service is formally available 24 hours day every day of the year	<input type="checkbox"/> Yes – go to Q3 <input type="checkbox"/> No – go to Q2
2. If the answer to 1 is NO , is the service formally covered under contract with another trust?	<input type="checkbox"/> Yes <input type="checkbox"/> No – go to Q3
3. Service is formally supported by on-call rota for a named individual for each of the following groups	
Consultant radiologist	<input type="checkbox"/> Yes <input type="checkbox"/> No
Radiographer	<input type="checkbox"/> Yes <input type="checkbox"/> No
Interventional radiology nurse	<input type="checkbox"/> Yes <input type="checkbox"/> No
Anaesthetist when appropriate	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Diagnostic imaging support such as CT is formally available 24 hours day every day of the year	<input type="checkbox"/> Yes <input type="checkbox"/> No
5. Facilities and consumables are available for each of the services listed	<input type="checkbox"/> Yes <input type="checkbox"/> No

Any deficiencies identified in interventional radiology service provision should be acknowledged and acted upon in accordance with the standards provided above.

Citation details:

The Royal College of Radiologists. *Standards for providing a 24-hour interventional radiology service*. London: The Royal College of Radiologists, 2008.

ISBN: 978-1-905034-31-4 Ref No. BFCR(08)13 © The Royal College of Radiologists, September 2008

For permission to reproduce any of the content contained herein, please email: permissions@rcr.ac.uk

This material has been produced by The Royal College of Radiologists (RCR) for use internally within the National Health Service in the United Kingdom. It is provided for use by appropriately qualified professionals, and the making of any decision regarding the applicability and suitability of the material in any particular circumstance is subject to the user's professional judgement.

While every reasonable care has been taken to ensure the accuracy of the material, RCR cannot accept any responsibility for any action taken, or not taken, on the basis of it. As publisher, RCR shall not be liable to any person for any loss or damage, which may arise from the use of any of the material. The RCR does not exclude or limit liability for death or personal injury to the extent only that the same arises as a result of the negligence of RCR, its employees, Officers, members and Fellows, or any other person contributing to the formulation of the material.

Design by innov8 graphic design: www.innov8gd.com. Printed by Gallpen Colour Print.