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Royal College
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Guidelines for Nursing Care in Interventional Radiology

The roles of the registered nurse and nursing support



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Foreword

The provision of appropriate nursing support in a department of clinical radiology is a vital component in the provision of patient care. This document outlines the issues, sets out models for nursing staff and describes the role of the interventional radiology nurse in the management of patients who are undergoing interventional radiology treatment. This document and its recommendations are designed to help in your discussions within your Trust with regard to setting appropriate levels of nursing support for departments. As Trusts have a wide variety of interventional radiology work and therefore different nursing requirements, the document does not identify a specific model but tries to ensure that the appropriate level of nursing and nursing experience are available in every department. Since this document was originally published in 2001 there have been further skills mix developments in department of clinical radiology and greater clinical responsibility amongst interventional radiologists, some of which have been devolved to nursing staff. In some clinical radiology departments this has resulted in the role of the health care assistant (HCA) expanding. The HCA will, after suitable training, be able to fulfill some of the functions previously the domain of registered nurses.

The Royal College of Radiologists and the Royal College of Nursing are most grateful to Dr Tony Nicholson of the RCR who has co-ordinated the project and Edna Piper who co-ordinated the RCN input. I am extremely pleased that the Royal College of Nursing have considered and approved this document and have allowed it to be published with their imprimatur, and I thank the RCN for their support and contributions and members of the Clinical Radiology Interventional Radiology Sub-committee for their input.

This document replaces the first edition of Nursing Care in Interventional Radiology (BFCR(01)3), which is now withdrawn.

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Dean

Faculty of Clinical Radiology

1. Background

- 1.1 This document has been created to emphasize the importance of nursing support in departments of clinical radiology. It has been generated for clinical radiologists to use in discussion with their hospital nurse managers and executive boards, to ensure that they understand the need for proper nursing support to be available appropriately within individual departments.
- 1.2 It is vital to ensure that patients are safe within the department of clinical radiology, and to ensure that adequate monitoring of the patient occurs before, during and after interventional procedures. This should be recognised as a key risk management issue for the Trust.
- 1.3 It is recognised that there may be difficulties in appointing nurses, even when the Trust has provided an adequate establishment. Departments of clinical radiology should have proper priority within hospitals where there is a shortage of registered nurses, and should not be left as the last area to receive nursing applicants. This may be addressed with the appointment of a senior radiology nurse (Band 8), with authority to manage the nursing budget within radiology and acting as a key figure within the department.
- 1.4 The clinical radiologist should make sure that appropriate support is available where possible. This document aims to assist in that process.

2. Introduction

- 2.1 Vascular and non-vascular interventional radiology is an established and expanding field. Many patients attend for day-case procedures, but a significant number are in-patients, some of whom are extremely ill at the time of their procedure.
- 2.2 Although general anaesthesia is occasionally required, the nature of minimally invasive vascular and non-vascular interventional radiology means that most procedures are carried out with conscious patients, who are often sedated. Like all surgical procedures, the techniques used require the full attention and concentration of the operator. Experienced, registered nurses are therefore vital members of the interventional radiology team. Their responsibilities are similar to those of nurses in operating theatres, with the additional responsibility of caring for the conscious patient.
- 2.3 As at least one-third of patients requiring vascular and non-vascular intervention present as emergency cases, it follows that there is a need for interventional radiology nurses to be available on a 24-hour basis. The importance of the interventional radiology nurse was highlighted recently by the NCEPOD report on interventional vascular and neurovascular radiology.¹
- 2.4 This document will help in the identification of nursing requirements of a department of radiology. It can also be used to encourage the Trust to ensure appropriate employment of skilled interventional radiology registered nurses and support staff in order to improve the comfort of patients and ensure their safety. It is not designed to prescribe specific standards as the range of work undertaken by departments and the nursing requirements will vary.

3. What is interventional radiology?

- 3.1 For the purpose of this document, interventional radiology encompasses any procedure which is invasive.
- 3.2 This document does not discuss routine diagnostic procedures such as barium enemas and intravenous injections of contrast medium. Instead it concentrates on only procedures that involve the insertion of a cannula, catheter or wire into a patient. This will include non-vascular procedures such as percutaneous transhepatic cholangiogram (PTC), nephrostomy and guided biopsy, as well as the wide range of vascular interventional procedures, from from angiography to abdominal and thoracic aneurysm stent grafting.

4. Models of nurse staffing in the interventional radiology department

4.1 Introduction

- 4.1.1 Some procedures, such as ultrasound-guided biopsy, might be considered safe to be performed without nursing support. However, it is always important to consider what is best for the patient. The majority of patients have considerable anxiety about even an apparently simple procedure and, from the patient's point of view, appropriate support is highly desirable. For relatively simple procedures such as biopsies, this support could be from suitably trained health care assistants. However, whenever analgesia or sedation is given, careful monitoring of the patient is mandatory and registered nursing support is therefore essential.^{2,3} Similarly where procedures are more complex and require scrubbed assistance, this assistance should normally be from an experienced interventional radiology registered nurse.
- 4.1.2 When nursing support is inadequate, patients will be left in the care of radiographers who have other tasks to perform and whose training is different from that of a qualified nurse. Although skills mix initiatives may provide radiographers with the necessary training for monitoring patients, their present high workload in their core tasks and their involvement in radiological skills mix initiatives often preclude this as an option. Nursing support is not optional for invasive procedures, but it should be considered essential both in-hours and out-of-hours. It is therefore necessary for departments of clinical radiology carrying out interventional procedures to have an adequate number of appropriately registered nurses to provide effective in-hours and out-of-hours nursing cover. The following are models as to how this might be done.

4.2 Departments with a large interventional radiology workload

- 4.2.1 Departments should have sufficient whole-time equivalent registered radiology nurses to provide at least one in five on-call cover. This ensures the availability of dedicated interventional radiology staff who are familiar with the department and its equipment and who also have a sound knowledge of interventional radiology techniques. This is a similar structure to that of most operating theatres, and has the additional advantage of more clearly defining the role of the interventional radiology nurse within the nursing community and for nurse managers. In many departments this will require extra staff resource, but financial problems should not be used as an excuse for not staffing departments adequately.

4.2.2 The provision of two nurses per dedicated interventional room is appropriate. At least one should be Band 5 or above. In some circumstances, depending on the type of procedure and level of training and experience available, a health care assistant (HCA) may be acceptable. Computed tomography (CT) and ultrasound rooms will require the availability of either one or two interventional nurses if complex interventions are being performed on sedated patients. Where procedures such as radio frequency ablation (RFA) are carried out under general anaesthesia in these rooms, registered radiology nursing may not be required. CT and ultrasound should have their own dedicated and adequately trained and qualified individuals who will assist with the simpler invasive procedures, such as biopsy or drainage in non-sedated patients.

4.3 Small departments or those that only perform a small number of interventional radiology procedures

4.3.1 Radiology department interventional nurses should be available to deal with all daytime procedures. This provision may be provided by a combination of full- and part-time specialist interventional registered nurses. The service may be supplemented during the day and particularly out-of-hours by one of two possible ways, both of which have disadvantages.

4.3.2 Existing theatre staff could be trained in interventional radiological techniques and departmental management, providing both in-hours and out-of-hours cover. Such nurses would have to be nominated and spend some time in radiology departments in order to familiarise themselves with the geography of the department, location of equipment and the techniques. However this approach has disadvantages.

- Most theatres already run a skeleton staff for out-of-hours work and operative procedures are often delayed during the night and at weekends due to limited theatre access. This option would clearly increase that burden.
- The interventional radiological cases might be considered as secondary in importance when pressure is high.
- Whilst there are many similarities between the environments of the operating theatre and the interventional radiology suite, the two are distinctly different and much thought should be given as to whether it is reasonable or safe to ask nursing staff to carry out both sets of duties.

4.3.3 Existing ward or casualty nurses who understand the department and radiology techniques could be trained in interventional radiology nursing. This approach also has disadvantages.

- Many wards and casualty departments are understaffed, not only in-hours but particularly out-of-hours, and the use of bank and agency nurses is high in some hospitals.
- Even with training, such nurses are unlikely to have the skills and experience to carry out interventional radiological nursing.

4.4 Healthcare Assistants

Where it has proved impossible to recruit interventional radiology nurses and where the above models have not been possible, the employment of HCAs with appropriate training and further education might provide support commensurate with the level of interventional radiology activity in a given department. However, such HCA support can never entirely replace that of registered nurses, the absence of whom might determine or limit the type of procedure that an individual department can safely perform.

4.5 The role of the interventional radiology nurse and the nursing team

- 4.5.1 A detailed description of the role of the interventional radiology registered nurse and HCAs in the interventional room is given in the Appendix. This is intended to be a statement of the core work undertaken and is provided to inform Trust and nursing managers who may be unaware of the sophisticated requirements of interventional radiology.
- 4.5.2 Training will depend on the complexity of the procedures but ENB(R50) would be appropriate for departments with a high interventional radiology workload.
- 4.5.3 Interventional radiology nurses should have appropriate bands/grades commensurate with the responsibilities undertaken and this should be stated for each post.
- 4.5.4 Interventional radiology nurses and support staff should always have knowledge of resuscitation to the appropriate level (advanced life-support training is preferable for nursing staff), and should have continued training in resuscitation techniques.
- 4.5.5 The roles that interventional radiology nurses fulfill in departments of clinical radiology are cited below. The performance of a number of cited tasks by the interventional radiology nurse does not relieve the clinical radiologist of the overall responsibility of ensuring that they have been undertaken and that any relevant facts have been acted upon. It is the primary responsibility of the registered nurse or assistant to monitor the patient and ensure their safety.

- **Pre-operative role**

Pre-assessment of planned admission is an established role of the interventional radiology nurse. Agreed protocols and an integrated care pathway should be established in order that the nurse is able to assess the patient's suitability for treatment as an out-patient or day-case, thus avoiding unnecessary, inappropriate and sometimes prolonged use of beds.

During pre-assessment the nurse instigates routine investigations and subsequently reviews and acts on the results according to agreed protocols and pathways (for example ensuring that patients receive intravenous hydration before contrast injections where necessary).

The nurse needs to possess knowledge of all interventional procedures in order to be able to inform and answer any questions the patient may have.

- **Pre- and post-procedure role**

Within the interventional suite, the nurse's role is to help plan the safety and care of the patient during the procedure, together with the other members of the multidisciplinary team. Two registered nurses may be required within the dedicated interventional room when complex procedures are being performed: one working directly with the clinical radiologist during the procedure; and the second monitoring the patient particularly with regard to pain relief and providing emotional support. The second nurse will also be ensuring that items of equipment required during the procedure are available (see Appendix).

Interventional nurses should have relevant competencies for cannulation and intravenous drug administration (in accordance with Trust policies) and must be updated in anaphylaxis skills requirements, as the expansion of the role of the interventional radiology nurse will result in the nurse having to place venous cannulae and administer intravenous drugs during interventional procedures.

The early recognition of adverse reactions to contrast media is also part of the remit of the radiology nurse. Following the procedure, patients may require intensive nursing supervision in an observation area or day-case ward. Some patients will also need to be reviewed on the ward following the procedure. The clinical status of the day-case patient needs to be assessed prior to discharge.

- 4.5.6 Day-case units within departments of clinical radiology are becoming an essential part of interventional radiology. Models for such units exist in many UK and European interventional radiology departments. These should be staffed by suitably qualified nurses who understand and have experience of both vascular and non-vascular interventional radiology. Such units differ from established day-case wards for surgery or cardiology because of the unique and varied nature of interventional radiology and the varied requirements of patients post procedure. Registered nursing staff should be supported by HCAs. A minimum staffing ration of one Band 5 nurse and one suitably qualified individual should be provided for each four beds.

5. Teaching

- 5.1 Interventional radiology is a progressive and expanding specialty. There is therefore a requirement for a programme of continued professional development for the nursing staff involved.
- 5.2 It is highly desirable that all student nurses – as part of their education – have some experience of interventional radiology. Therefore, the aim should be to encourage senior radiology nurses to pursue this with the attached University for training. This experience will raise awareness and understanding of interventional procedures, with clear implications for improvement in the care of such cases in the ward environment. The student allocation is paramount in planning for the future workforces if interventional radiology is to expand.
- 5.3 Knowledge of those aspects of radiation protection relevant to interventional radiology nursing practice should also be a requirement. It is in the interests of departments to provide such training to all staff.

6. Role development

- 6.1 There is great potential to develop the role of both the interventional nurse and the HCA.
- 6.2 An extended role for nurses might include nurse-led services such as hysterosalpingograms, patient pre-assessment, the evaluation of procedure requests, minor procedures such as arteriography, venography and venous access, protocols for discharging patients, patient consent, follow-up and liaison with other specialties.
- 6.3 The HCAs may be able to develop their role, following suitable training, to incorporate patient care pre- and post-procedure as well as assisting during procedures.

7. Recommendations

- 7.1 The highly technical field of interventional radiology nursing requires knowledge, skills, creativity and versatility that should be offered by competent individuals suitably trained and qualified to perform the required tasks to the required standards. This also includes support staff.
- 7.2 Appropriately banded interventional radiology registered nurses should be available in all departments of clinical radiology undertaking interventional radiology procedures, if the care delivered is to be of high quality and low risk. This will also allow the future career progression of staff and alleviate staffing issues.

The suggested career structure might be:

- a Radiology Modern Matron Band 8a
- a Radiology Nursing Manager Band 7
- a Radiology Sister Band 6
- a Radiology Staff Nurse Band 5
- a HCA Band 3 with NVQ Level 3
- a HCA Band 2 NVQ Level 2

Banding for assistants could equate to a certain level of experience, although this is dependent on the individual and their competence being assessed by a senior nurse in the department.

- 7.3 Safety and monitoring of patients should be a priority in interventional radiology departments. Registered nursing staff and assistants are thus a vital part of the interventional radiology team, and should be available for all interventional radiological procedures.
- 7.4 Departments of clinical radiology carrying out interventional radiology procedures should have sufficient registered nursing and support staff to carry out those procedures adequately and safely, both within the normal working day and outside conventional working hours.
- 7.5 Departments undertaking interventional procedures vary in size and in the number and complexity of interventional radiological procedures they perform. Large dedicated interventional radiology departments should have sufficient registered nurses and support staff to provide clinically acceptable cover outside the normal working day and at weekends. Small departments carrying out occasional interventional procedures as emergencies at these times should ensure that a structure is in place to provide a sufficient number of appropriately trained nurses. This may be achieved in conjunction with operating theatre and ward nurses.

BFCR(06)7

Approved by the Board of the Faculty of Clinical Radiology:

23 June 2006

References

- 1 *National Confidential Enquiry into Peri-Operative Deaths (2000)*. Interventional Vascular and Neurovascular Radiology. London: NCEPOD, 2000.
- 2 Royal College of Radiologists. *Safe Sedation, Analgesia and Anaesthesia within the Radiology Department*. London: The Royal College of Radiologists, 2004.
- 3 Royal College of Anaesthetists and Royal College of Radiologists. *Sedation and Anaesthesia in Radiology*. London: RCA/RCR, 1992.

Appendix: Roles

The roles of the interventional radiology nurse and healthcare assistant (HCA) in the management of the patient undergoing treatment are outlined here.

A1 Pre-procedural nursing care

The comprehensive pre-procedural care of patients requiring vascular and/or non-vascular interventional radiology is essential. This involves assessing the physical and psychological well-being of a patient through pre-procedural interview. At this time drug, medical and social histories can be obtained. Most patients, despite their best efforts, have little understanding of the procedures they are about to undergo. Experienced nurses are often in a position to assess the degree of knowledge and anxiety prior to the procedure, thereby allaying patient fears through explanation and reassurance. The nurse will be assisted in this task by the provision of patient information leaflets, many of which have been generated by the RCR/BSIR in conjunction with the Clinical Radiology Patients' Liaison Group of the RCR (www.rcr.ac.uk).

The nurse may:

- support and inform family members and carers who often accompany patients for both elective and emergency procedures;
- liaise with referring doctors and ward staff to ensure pre-procedural work is completed;
- prepare equipment for the safe care of the patient during the procedure;
- communicate with other members of the interventional radiology team regarding the patient, thereby promoting good working relationships within the team;
- identify and act upon potential hazards to both patients and staff and, where appropriate, act to prevent patient injury;
- identify potential complications of various drugs used during the procedure, including contrast;
- be able to obtain the patients consent for the procedure in line with local policy.

A2 Procedural patient care

During any interventional radiology procedure the nursing staff are an important aspect of the interventional radiology team, either in the circulating or in the assisting role. Whilst involved in the procedure, the nurse can expect to:

- participate in the planning of the procedure and the management of the procedural list;
- assess, plan and implement the total care of the conscious or conscious-sedated patient (this includes the monitoring of pulse, blood pressure and oxygen saturation);
- ensure the patient's identification;
- co-ordinate and document planned patient care during the procedural phase;
- create a safe and therapeutic environment for both the patient and the staff;
- practise and monitor the correct wearing of gowns, gloves and masks where necessary;
- practise the principles of asepsis and act as a lead professional in infection control;
- communicate effectively with other members of the interventional radiology team.

A3 Nursing and support duties during the procedure

A3.1 The scrub nurse

The scrub nurse prepares sterile instruments and equipment ready for the procedure.

A3.1.1 Before the procedure the scrub nurse's duties should be to:

- check the requirements for the procedure with the clinical radiologist and collect any specialist equipment and instruments needed;
- check the patient has given informed consent and where appropriate signed the consent form;
- confirm with the patient and clinical radiologist the correct procedure, site and side of the intervention;
- ensure that the patient is placed safely on the radiology table;
- gown and glove using an aseptic technique;
- drape the trolleys and bowl stands with sterile drapes, with or without pre-packed sets;
- assemble sutures, needles, blades and other necessary sterile equipment with the assistance of the circulating nurse;
- assist in skin preparation and draping;
- dispense catheters, swabs and other equipment as needed, and clean and replace catheters and wires as required;
- keep an accurate account of catheters, wires and blades collected during the procedure and make sure that drugs in syringes are labelled appropriately and are in date;
- anticipate the needs of the clinical radiologist by continually observing the progress of the procedure.

A3.1.2 At the end of the procedure the scrub nurse should:

- check (and may apply) appropriate wound dressing;
- remove drapes and ensure that catheters or drainage tubes left in situ are secure and that haemostasis has been achieved;
- ensure that needles and blades are disposed of according to Health and Safety Executive guidelines and clear the working surface;
- dispose of all contaminated materials;
- ensure that the area around the wound dressing is clean and that the patient's gown and sheet are clean and dry;
- hand over to the ward nurse or the post-procedure nurse all documentation of the procedure.

A3.2 The circulating nurse or assistant

The term 'circulating nurse' is used in many hospitals to refer to the nurse or support worker who is not scrubbed and who is responsible for assisting throughout the procedure.

- A3.2.1 Before the procedure the circulating nurse should:
- check that the procedural room is clean, has the appropriate temperature and humidity, and that suction apparatus, oxygen and any required lighting is in working order;
 - ensure that emergency drugs are available and that the defibrillator and crash trolley are checked (this should be ideally done first thing in the morning);
 - collect the necessary catheters and equipment;
 - prepare sterile gowns and gloves for the team and assists in tying gowns;
 - open instruments and bowl packs and other necessary equipment for the scrub nurse.
- A3.2.2 During the procedure the circulating nurse or assistant should:
- reassure the patient and endeavors to resolve their concerns;
 - monitor the patient at all times ensuring the comfort and safety of the patient and, where appropriate, records pulse, blood pressure and oxygen saturation;
 - ensure that the clinical radiologist is aware if the patient is in pain;
 - remain in the procedural room throughout;
 - connect any monitoring equipment required;
 - replenish swabs, catheters and wires as requested;
 - fill bowls with sterile saline and heparin, or ensures a constant supply of these when closed systems are used;
 - provide drugs, such as sedatives, anticoagulants and vasodilators, ensuring that they are in-date and checks these with the scrub nurse or clinical radiologist.†
 - ensure there is no unnecessary movement of staff through the procedure room doors occurs;
 - prepare the wound dressing and hands to scrub nurse.
- A3.2.3 On completion of the procedure the circulating nurse or assistant registered nurse should:
- ensure monitored readings are recorded and all drugs given are recorded and signed for;
 - ensure that the clinical radiologist has prescribed the post-procedure medication.
- A3.3 The support staff member should:
- ensure that the room is clean and prepared for the next case;
 - help with removal of drapes and the preparation of the patient for return to the ward or recovery room;
 - remove the instrument trolley and other equipment to a dirty utility area.

† This duty must be undertaken by a registered nurse.

A4 Post-operative patient care

In some departments of clinical radiology a specific room will be designated as a recovery or day-case area. Whether or not this is the case, patients will often have to wait for transport back to a ward. In addition, an increasing number of out-patient and day-case procedures are performed, and all these patients require care in the immediate post-procedural period. Many patients will still be sedated in the recovery area. Care of the post-procedural patient requires careful observation by the interventional radiology registered nurse and planned intervention for complications.

A4.1 Such observations should include:

- recognising the early signs of complications and acting upon these as appropriate;
- maintenance of a patient's airway, which can become obstructed by the tongue, secretions or vomit;
- observation of the rate and depth of respiration in order to treat respiratory depression if it occurs;
- maintenance of an adequate circulation – many patients become hypotensive during and after interventional procedures due to vagal stimulation or unplanned bleeding;
- observation of puncture site and foot pulses;
- neurological observations following cerebrovascular interventions, vertebroplasty and aortic stent grafting;
- skin colour, and in particular development of pallor which could indicate shock;
- patient comfort – often the post-procedural patient is restless and can easily come to lie in an unsatisfactory position, which can cause undue pain and cause pressure necrosis, particularly in the elderly;
- the degree of patient's pain and its control.

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Citation Details

The Board of the Faculty of Clinical Radiology. The Royal College of Radiologists; The Royal College of Nursing
Guidelines for Nursing Care in Interventional Radiology
Royal College of Radiologists, London.

On publication this document will be made available on the College's web site: www.rcr.ac.uk

ISBN 1-905034-17-2 RCR Ref No. BFCR(06)7 © The Royal College of Radiologists, 2nd Edition November 2006

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Design by Tin Dog: www.tindog.co.uk

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