Investing in the interventional radiology workforce: the quality and efficiency case
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Executive summary

1. Interventional radiology (IR) is at the centre of modern medicine and is critical to the strategic objectives of the NHS.

2. High-quality IR delivers significant improvement in patient outcomes.

3. There is an increased demand for better access to IR services. A recent survey showed an average 21% rise across radiology departments in the number of IR procedures between 2010 and 2012.1

4. The growth in demand on interventional radiologists comes in a number of forms, including the rising number of elective attendances, increased scope and complexity of procedures, and greater need for out-of-hours access to services for emergency care.

5. Due to the expanding range of available interventional procedures, and the increasing inherent complexity of the procedures, there is additional demand on interventional radiologists. Regardless of population growth, it is widely accepted that the workload of interventional radiologists will continue to increase with continued advances in imaging technology.

6. IR has shown innovation in managing the challenges of this increasing workload, but the measures employed will not provide a sustainable solution.

7. Precise estimates vary, but there is an acknowledged substantial under-provision of fully trained interventional radiologists. Prior to the understanding of the requirements for trauma centres, a 2012 report by the Centre for Workforce Intelligence (CfWI) looking at a minimum 1:5 on-call rota showed a shortfall of 200 IR consultants.2 It is clear that a minimum 1:6 rota is required to maintain a sustainable service, therefore the shortfall has been underestimated.

8. Vacancy data included in The Royal College of Radiologists’ (RCR) 2012 census showed 36 unfilled consultant interventional radiologist posts, equating to 8% of the current IR workforce in England.1 Over half of these posts failed to appoint, largely due to a lack of suitable applicants.

9. The high number of expected retirements in the next few years, set against static training numbers, means that the gap between workforce supply and demand in IR will not close.1 If this is not rectified, the situation will continue to deteriorate and will seriously affect patient care and safety.

10. To address the shortfall, the RCR is seeking an increase of 25 trainees per year for the next five years. Additional capacity exists in the UK training scheme to accommodate these numbers. The RCR believes an increase of 25 per year is realistic and the minimum required to sustain a safe interventional service across England.

11. This document has been developed to put forward the case for investing in the interventional radiology workforce in England, however it could be used as a basis for a similar proposal in other devolved nations.
There has been an average 21% increase in the number of IR procedures between 2010 and 2012.

There are 36 unfilled consultant radiologist posts equating to 8% of the current IR workforce in the UK.

Less than one third of units are able to provide comprehensive out-of-hours IR care.

Over 90% of IR procedures are undertaken through incision less than 5 mm.

With the use of IR, lower limb ischaemia can be treated as a day case procedure taking 30–40 minutes avoiding the need for general anaesthesia and 3–5 days in hospital if bypass surgery is undertaken.

Networks should aim for a rota frequency of 1:6; units covering populations of more than one million should aim for 1:8 or greater.

The RCR believes an increase of 25 trainees per year is realistic and the minimum necessary to sustain a safe IR service across England.

Centre for Workforce Intelligence data suggest that an additional minimum of 200 IR consultants are required to provide adequate out-of-hours treatment in England.

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1. Introduction

IR is a minimally invasive alternative to open surgery that uses radiological image guidance. IR is now facing a major challenge to sustain existing services and accommodate very significant increases in the number and complexity of procedures and an escalating clinical role. The subspecialty has developed at a rate where many departments are encountering problems in providing a comprehensive service as suggested in best practice guidelines.3

One of the key constraints to developing IR is the lack of appropriately trained staff. Consultant numbers need to be substantially increased to allow a safe emergency service, but also one that can also respond to patients’ routine needs.

A key aim of this document is to facilitate a clear understanding of how the interventional radiologist forms a vital part of many patients’ treatment pathways, and the pivotal role of IR in healthcare. The authors hope that with this increased awareness, those who read this document will understand and support the case for an increase in the IR workforce in England which is discussed in the second part of the document. Although the focus of this document is on medical staffing, it is important to recognise there are similar concerns for allied health professionals, in particular IR nursing, which will be addressed in a subsequent document.
2. The role of interventional radiology in healthcare

IR plays a crucial role in the delivery of safe and effective patient-centred care, and is critical to the strategic objectives of the NHS. It has produced major improvements in safe, patient-focused care and has demonstrated cost-effectiveness in the treatment of numerous conditions.

IR is a vital component of hospital medicine, providing lifesaving care, both in and out of hours. IR services have replaced or enhanced many surgical procedures as well as allowing new treatments for patients which were not previously feasible.

The provision of IR services, however, remains variable with many hospitals having limited or, in some instances, no direct access.

IR occupies a central role in service provision in relation to other key referring specialties (see Figure 1). IR has shown it can make significant improvements in:

- Patient outcomes
- Patient experience
- Patient safety
- Efficiency.

Figure 1. The central role of interventional radiology
Patient outcomes

IR directly contributes to all domains of the NHS Outcomes Framework published in 2011. This is illustrated by the following examples.

Preventing people from dying prematurely

- **Aortic aneurysm**: Rupture of the abdominal and thoracic aorta can be prevented and treated by the insertion of covered stents, which has largely replaced conventional surgery for this condition. In some cases, these procedures are now carried out under local anesthesia.

- **Gastrointestinal haemorrhage**: Embolisation therapy is increasingly performed by interventional radiologists for the control of uncontrolled bleeding from the lower and upper gastrointestinal tract. This lifesaving procedure carries a much lower risk to the patient and, in many cases, is the treatment of choice. Example 1 illustrates a common clinical presentation where improved outcomes are delivered.

Example 1. Endovascular treatment of bleeding

A frail 74-year-old female presented with rectal bleeding. The bleeding was so severe that the patient was in a critical condition.

The hospital had on-call interventional and diagnostic radiology. She was taken directly from the accident and emergency (A&E) department for a computed tomography (CT) scan where the site of bleeding in her ascending colon was determined. She was then taken to the IR suite where angiography confirmed bleeding from the site indicated on the CT scan. The bleeding artery was blocked and the bleeding successfully stopped using three micro-coils. The only alternative treatment would have been major surgery to remove the colon.

After three days recovery on the ward she was discharged home.

Enhancing quality of life for people with long-term conditions

- **Postpartum haemorrhage**: Bleeding after childbirth remains the most common cause of maternal death and the role of IR in managing this emergency is well established.

- **Cancer treatment**: Using minimally invasive techniques, early cancers can be destroyed using radiofrequency or cryotherapy. Patients avoid the need for major surgery and long-term outcomes are very favourable. Newer techniques allow selective radiotherapy or chemotherapy for the treatment of liver lesions. Embolisation can be used to devascularise tumours prior to surgical resection with resulting improvements in safety.

- **Early management of stroke**: In the early stages of stroke, infusion of thrombolytic agents dissolve the clot and mechanical removal of blood clots can be performed to minimize disability and reduce the risk of death. Patients who suffer stroke from subarachnoid haemorrhage (bleeding around the brain) are now most frequently treated by interventional radiologists using embolisation techniques.

- **Renal obstruction**: Obstruction of the kidney is frequently complicated by infection which leads to septicaemia (infection in the blood stream) and risk of death. Fluoroscopically or ultrasound-guided insertion of a drainage tube into the obstructed kidney is a simple lifesaving procedure.

- **Peripheral vascular disease**: Peripheral arterial disease may lead to difficulties in walking and, in its later stages, is associated with limb loss and increased mortality. Angioplasty and stenting, which can often be performed as a day case, can improve walking distances for the patient with claudication, and prevent amputation in those patients with more advanced critical limb ischaemia.

- **Renal failure**: When renal dialysis fistulas become blocked or narrowed, angioplasty and stenting can be used to restore function and avoid the need for additional surgery to create a new fistula. Interventional radiologists can also insert central venous catheters for patients who require temporary dialysis. In patients with transplanted kidneys, radiological intervention can be used to correct narrowing of the transplant artery where there is evidence of transplant failure.

National Imaging Board 2009
Orthopaedic and spinal intervention: Commonly performed musculoskeletal interventions include joint and nerve root injections for the relief of chronic pain and many of these can be performed using ultrasound guidance as day-case procedures. Fractured and collapsed vertebrae can be treated by the injection of cement to relieve pain and prevent neurological injury.

Palliation for malignant disease: A wide range of image-guided interventions are used in the management of patients with malignant disease. These include the ablation of tumour deposits in solid organs and embolisation of painful bony metastases. Stents can be used for the relief of obstruction caused by tumours invading the major blood vessels, airways, oesophagus and hepatobilary system. Targeted chemo- and radiotherapy are used for the treatment of metastatic disease in the liver.

Helping people to recover from episodes of ill health or following injury

Trauma: The Trauma Strategy has acknowledged that the UK lags behind similar developed countries in providing timely access to the full range of services likely to preserve life. Access to IR (and diagnostic imaging) are essential.

Improved outcomes are well documented in patients suffering damage to the thoracic aorta following high-speed trauma where IR is used to treat traumatic aortic injuries with stent-grafts, avoiding the need for open chest surgery. In multi-trauma cases, embolisation is used to control life-threatening bleeding associated with pelvic fractures, often in young patients.

Patient safety

IR is a well-established discipline used to treat (and palliate) numerous medical and surgical conditions instead of the more traditional invasive procedures which often involve the risks of general anaesthesia and open surgery. There are numerous examples of such radiological interventions, including stopping acute gastrointestinal haemorrhage by embolisation of the bleeding artery, stenting aortic aneurysms or dissections, relieving jaundice caused by obstruction of the main bile duct and removal of kidney stones, to name but a few.

As the great majority of IR procedures are performed with local anaesthetic, the risks associated with general anaesthesia are avoided which is particularly important in the elderly and those patients with multiple co-morbidities.

Efficiency

The important role of IR is illustrated by its expanding applications in the recently updated Same Day Emergency Care Best Practice Tariffs 2013–14. These include angioplasty and stenting, treatment of aortic aneurysms and embolisation treatment for uterine fibroids. The aim is to facilitate ongoing care with reduced, and in some conditions without, admission for a significant number of patients.

Efficiency savings which result from interventional treatments relate to decreased in-hospital stays, reduced occupancy of operating theatres, avoidance of general anaesthesia and a shift to more day-case procedures. In turn, these offer significant reductions in morbidity and mortality in comparison to conventional surgery.

A simple illustrative example is the treatment of lower limb ischaemia – femoropopliteal bypass performed under general anaesthesia takes 2–3 hours and requires a hospital stay of 3–5 days. In the same patient, femoral angioplasty, performed as a day case, can be completed in 30–40 minutes.

Patient experience

Many IR procedures, such as angioplasty, insertion of central lines for chemotherapy and unblocking of failed dialysis fistulas, are routinely performed as day cases, avoiding the need for hospitalisation with attendant cost savings and reduction in the risk of infection.

Uterine artery embolisation (UAE) is a minimally invasive way of treating symptomatic uterine fibroids. The treatment is effective, safe and, compared to surgery, facilitates a prompt return to normal activities and is more cost-effective. UAE is recommended by National Institute of Health and Care Excellence (NICE) and supported by guidelines from the RCR and the Royal College of Obstetricians and Gynaecologists (RCOG).
3. The role of the interventional radiologist

Interventional radiologists are radiologists who have undergone additional specialist training in the practical elements of minimally invasive (using incisions of 2–5 mm) treatments, performed under imaging guidance, that play a vital role in both elective and emergency patient care. IR became a discrete subspecialty in 2010 with a separate training curriculum.

IR practice is significantly different from diagnostic radiology and includes additional clinical responsibilities for pre-intervention assessment, consent and follow-up, in addition to a requirement for technical procedural skills. Interventional radiologists possess a broad spectrum of clinical and diagnostic skills. It is primarily a consultant-delivered service, particularly for out-of-hours emergency care.

In these various roles, the interventional radiologist contributes to patient safety, patient outcomes and service improvement, as illustrated in Figure 2.

The value of the interventional radiologist in providing a consultant-delivered service should not be underestimated. The following is an excerpt from the Academy of Medical Royal Colleges publication *The benefit of consultant-delivered care*.

The key benefits of consultant-delivered care, identified in the written and oral evidence received are:

- Rapid and appropriate decision-making
- Improved outcomes
- More efficient use of resources
- General practitioner (GP) access to the opinion of a fully trained doctor
- Patient expectation of access to appropriate and skilled clinicians and information
- Benefits for the training of junior doctors.

Figure 2. The role of the interventional radiologist
4. The case for an increased workforce

One of the key constraints to developing IR is the lack of appropriately trained staff. Consultant numbers need to be substantially increased to allow a safe emergency service, but also one that can respond to patients’ routine needs.

The previous sections demonstrate that IR is an essential component of modern medicine and as a result there has been a marked increase in the demand for its services. This increased demand on interventional radiologists comes in a number of forms:

- Increased number of elective attendances
- Increased scope and complexity of procedures
- Increased need for out-of-hours interventional services for emergency care
- Increased clinical role.

**Increased number of elective attendances**

A recent survey showed an average 21% rise across radiology departments in the number of IR procedures between 2010 and 2012.1 There is no evidence from this data that the demand has begun to plateau and so a year-on-year increase is expected for the foreseeable future.

**Increased scope and complexity of procedures**

The scope and complexity of IR procedures continues to increase. Some examples include interventional oncology, fibroid embolisation, endovascular aneurysm repair (EVAR) and fenestrated endovascular aneurysm repair (FEVAR), and renal replacement therapy. All of these procedures make significant improvements to patient outcomes and choice, offering less invasive, lower morbidity treatment options than conventional surgical techniques.

**Increased need for out-of-hours interventional services for emergency care**

Interventional radiologists have an increasingly important role to play in the provision of lifesaving emergency care. Key elements of this include procedures for control of bleeding, abscess drainage, relief of acute renal and gastrointestinal obstruction, and the endovascular treatment of ruptured aortic aneurysms. Placing a nephrostomy drain in a patient with pyonephrosis (obstructed kidney with infected urine) is a simple lifesaving interventional procedure that is commonly requested out of hours.

A recent survey of units by NHS Improving Quality (NHS IQ) demonstrated that less than a third are able to provide comprehensive out-of-hours IR care, potentially putting many patients at risk.11

A status map of IR across NHS England has been developed to demonstrate the current provision of both in and out-of-hours services (see Figure 3, opposite).12 The map demonstrates that almost half (45%) of services in England do not currently have either local or network access to IR services out of hours. Audit data of the provision of successful out-of-hours services indicate that the most frequent emergency calls are for embolisation for gastrointestinal bleeding and nephrostomy access. These are common conditions received within most medical and surgical units in England. A significant factor in the failure to provide these services remains a shortage of trained interventional radiologists.

A number of IR services have already developed 24/7 access, with the expected improvements in patient care but in all instances it has required an increased IR workforce.

The RCR strongly supports the principles laid out in the publication NHS Services, Open Seven Days a Week: Every Day Counts, which states that:

‘Hospital inpatients must have timely 24 hour access, seven days a week, to consultant-directed interventions that meet the relevant specialty guidelines, either on site or through formally agreed networked arrangements with clear protocols, such as critical care, interventional radiology, interventional endoscopy and emergency general surgery.”10
A report by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) in 2007 concluded that all hospitals with maternity units should provide an out-of-hours IR service to save the lives of patients with catastrophic postpartum haemorrhage (see Example 2, overleaf).13,14

Postpartum haemorrhage remains a significant cause of maternal mortality in the UK and it is the third highest direct cause of maternal death. An investigation at Northwick Park Hospital into ten maternal deaths identified a lack of IR availability as a contributing factor.15

Key
Red: No core service provision and no network pathways – includes ad hoc rotas
Amber: Some core services available on a formal rota, limited formal network provision
Green: Core service provision or partial service provision with a formal rota and formal network pathways to an agreed recipient trust.
White: No data received

In the above maps, those centres appearing in red or amber are unable to provide 365/24/7 access to out-of-hours IR
Reproduced with the kind permission of the British Society of Interventional Radiology.
Increased clinical role

Interventional radiologists possess the required skills and knowledge to help patients make appropriate treatment decisions, particularly prior to complex IR procedures. Interventional radiologists also have responsibility for undertaking the clinical assessment, review and appropriate further management of patients – both in an outpatient setting and on the ward.

Multidisciplinary team meetings (MDTMs)

MDTMs are the main fora for deciding patient management and many decisions are made based on the results of image-guided biopsy. The close working relationships of the interventional radiologist with their front line clinical colleagues, as well as other vital members of these teams, can significantly improve the outcomes for patients ensuring rapid access to appropriate interventional treatments. Figure 4 shows the typical range of such teams involving interventional radiologists.

Example 2. Maternity units and out-of-hours services

A 23-year-old female had a healthy child delivered by caesarean section. She bled postoperatively and was taken back to theatre. She continued to bleed and required 24 units of blood. The on-call IR team was called at approximately 2:45 am and an angiogram revealed a bleeding vessel which was successfully embolised by a procedure that took 15 minutes. There was no further uterine bleeding and the patient rapidly stabilised requiring no further treatment. She now plans to have a third child. Without IR, the likely outcome would have been a hysterectomy.

National Imaging Board 2010.
5. The shortfall – the current and predicted workforce

The evidence

The requirement for an expanded IR workforce is evidenced in *Regional Networks for Major Trauma*, a report by NHS Clinical Advisory Groups recommending 24-hour access to interventional and diagnostic radiology capability. This is further supported by two Department of Health (DH) publications:

- *Interventional Radiology: Guidance for Service Delivery*[^5]
- *Interventional Radiology: Improving Quality and Outcomes for Patients.*[^14]

The latter illustrates how the NHS can improve quality, safety and productivity while delivering comparable or better outcomes for patients with shorter hospital stays and fewer major complications.

The 2012 RCR census achieved a 100% response and was acknowledged by the CfWI as the most accurate assessment of the current workforce.[^1] It builds on equivalent data for previous years.

Vacancy data collected through the census in 2012 showed there were 36 unfilled consultant interventional radiologist posts, equating to 8% of the total IR consultant posts in England. Over half of these have been re-advertised but failed to appoint.[^1] In the majority of cases this was due to a lack of suitable applicants. There is a very significant concern that long-standing vacancies have already had an effect on producing hidden vacancies, as many trusts will not explore business cases for further expansion if they cannot fill existing posts.

It is likely that the advertised vacancy rate is an underestimate of the current problem as a number of units will not have advertised as they were certain the vacancy would not be filled.

Example feedback from individual trusts through the RCR census:

*We are a major trauma centre, but cannot provide a robust 24/7 IR on-call rota as we cannot recruit interventional radiologists… we do have training resource for more trainees than our present establishment and we see additional trainee numbers as the only realistic solution to this problem.*

*NHS trust, north east England*

*We are having huge problems recruiting an interventional radiologist to an already understaffed service thereby compromising its very existence.*

*NHS Trust, north west England*

The government and NHS are committed to ensure that health inequalities are removed. 'Paul Baumann, Chief Financial Officer for NHS England, said: “We have an absolute duty to tackle health inequalities and to ensure equal access for equal need right across the country.”[^16]*

In the context of IR this is most explicit in the variable provision of out-of-hours radiology demonstrated above, but also widespread inpatient access to the whole range of interventional procedures depending on where they live, and the local interventional expertise and facilities.

As will be seen in Section 6, the shortage of trained interventional radiologists is even more acute than previously estimated and well above the number of currently unfilled posts. Data from the CfWI suggests that an additional minimum of 200 IR consultants are required to provide adequate out-of-hours treatment in England, and current numbers in training are significantly below these requirements.
The risks of the current shortfall

The beneficial role that IR can play in patient safety has already been demonstrated, but the converse is also true. If IR cannot keep up with the demands placed on it, inevitable delays in treatment or failure to treat will occur, creating safety issues.

Many services are currently under intense pressure and emergency cover is delivered by onerous rotas that are unsustainable.

The current shortfall in the IR workforce in England, and the consequent inability to cope with the workload which is the remit of an interventional radiologist, is leading to low morale in many radiology departments. This has led, in a number of instances brought to the attention of the RCR, to prolonged absenteeism of consultant radiologists through stress-related illness. Obviously this compounds the situation, leading to further stress for the remaining interventional radiologists in the department, worsening morale and creating even greater difficulty in coping with the workload. The RCR census has provided worrying data on the high percentage of consultant radiologists opting for early retirement or leaving the profession early – a further indicator of work-induced burnout. A UK study showed that radiologists appear to be at greater risk of burnout than consultants working in other specialties, predominantly related to workload and inadequacies in staffing and facilities.17

Furthermore, many consultant interventional radiologists are at risk of the cumulative effects of high levels of radiation exposure as a result of arduous working patterns. New European legislation will significantly reduce permissible levels of exposure to the eye and will lead to a reduction in the number of interventional sessions which can be provided by any individual.18

The action IR has taken to address the shortfall

Interventional radiologists have adopted new technological advances to reduce some of the burden of work. A good example is the use of non-invasive vascular imaging by ultrasound and magnetic resonance imaging (MRI) to replace some of the diagnostic angiographic studies.

Further efficiencies can be achieved through the use of one-stop clinics for fibroid embolisation and vascular interventional patients. Some units have developed clinical networks to improve the provision of out-of-hours IR. Although skill-mix has been embraced in diagnostic radiology, it is not widely applicable to IR. Some relatively minor procedures, such as tunnelled central line insertion, are being carried out by highly trained nursing and radiographic staff; however, a much greater level of expertise combined with the knowledge and skills of a doctor are required to carry out the majority of the highly technical IR procedures.
6. Closing the gap – the proposed solution

The 2012 RCR census identified a total of 395 consultant interventional radiologists employed in substantive posts in England.1

Precise estimates vary, but there is an acknowledged substantial under-provision of fully trained interventional radiologists. Prior to the understanding of the requirements for trauma centres, a 2012 report by the CfWI looking at a minimum 1:5 rota showed a shortfall of 200 IR consultants.2 It is clear that a 1:6 rota is required and this is therefore an underestimate.

Figure 5 shows the estimated gap between the supply of interventional radiologists and that required to deliver effective, safe, patient-centred IR services. The relatively minor increase in the predicted workforce supply is due to a high number of retirements expected in the next few years, set against the number of anticipated trainees who are on the IR pathway. This represents maximum numbers as some of these trainees may leave the pathway at year five if they secure a consultant post or fail to get year six funding. Therefore, even with the proposed increase in training numbers, some additional service reconfiguration will be required at least in the short term.

This graph demonstrates that even with an increase of 25 training posts per year from 2015, there would still be a significant shortfall for the foreseeable future.

The following assumptions have been applied.
- All trainees gaining a Certificate of Completion of Training (CCT) in interventional radiology begin working as IR consultants within the same year
- Young leavers from consultant workforce modelled at c.2% PA1
- Average retirement modelled at 62, with those aged 62+ expected to retire equally over the next five years1
With a high number of expected retirements in the next few years, the current numbers in training will not allow us to close the gap between supply and demand in IR and the provision of adequate IR services in England will be jeopardised.

While estimates indicate an approximate current shortfall of 200 consultant interventional radiologists, the RCR recognises that there is a limit to the number of additional trainees which could immediately be accommodated within training schemes. The RCR proposes that a realistic figure would be an increase of 25 trainees per year for the next five years.

Any increase in IR trainees would need to be in addition to the previously agreed increase of 30 trainees for diagnostic radiology. It should be noted that there has been little progress in achieving this increase of 30 diagnostic radiology trainees, mainly due to funding considerations.

The figure of 25 trainees is based on results from a recent British Society of Interventional Radiology (BSIR) survey which confirmed there is capacity in the system for 25 additional trainees per year for the full six-year training for the next five years.

The RCR believes an increase of 25 trainees per year is realistic and the minimum necessary. Even with this increase, it is likely that service reconfiguration may be required in order to sustain a safe IR service across England.
7. Conclusion

IR and interventional radiologists are crucial to the delivery of high-quality, safe and efficient patient-centred care. The developments and innovations implemented by interventional radiologists over the last two decades have fundamentally altered and radically improved healthcare.

The workload for the interventional radiologist has increased significantly, not only in volume but also complexity. This has been driven by the ever-expanding range of interventional procedures and the increasing inherent complexity of the procedures themselves. Regardless of population growth, it is widely accepted that the workload of interventional radiologists will continue to increase with further advances in imaging technology.

IR has shown further innovation in managing the challenges of this increasing workload, but the measures employed will not provide a sustainable solution.

Forecasts show that supply is not expected to reach the RCR projected requirement level within the next ten years. The RCR has serious concerns over the inadequate size of the current IR workforce and the ability of the specialty to meet service needs and deliver the quality of care patients deserve.

The RCR believes an increase in the number of training posts in IR is essential to sustain effective radiology services.

The RCR is seeking an increase of 25 trainees per year for the next five years in the UK. There is capacity in the UK training schemes to accommodate such an increase.

As well as alleviating the current pressure that interventional radiologists are experiencing, consultant expansion in IR would deliver a number of important benefits, such as:

- Improved patient choice and better patient experience
- Increased patient safety and reduced mortality
- Significant cost savings to the NHS
- Improved country-wide access to full IR services
- Improved provision of emergency out-of-hours IR
- The shift to extended day and seven-day working patterns in healthcare.
References


