

# WHAT IS INTERVENTIONAL RADIOLOGY?



## What is Interventional radiology?

Interventional radiology, or IR, is a new specialty that has been responsible for major recent medical advancement. It is at the forefront of medical technology and innovation. Although IR is less well known by GPs, IR is typically referred to as the specialist's 'specialist'. It is responsible for image-guided minimally invasive procedures and therapies you may have thought more usually carried out by surgeons.

IR is a minimally invasive alternative to open surgery that uses radiological image guidance (X-rays, ultrasound, CT and MRI) to aid treatment. In many circumstances, surgery can be avoided and the risks to the patient can be lowered with faster recovery times. IR can also be used as an adjuvant to surgery and combined procedures with surgeons can optimise patient care.

## When did IR start?

IR developed in diagnostic angiography in the 1960s, after the Seldinger technique was described by Dr Sven-Ivar Seldinger in 1953. The technique described used a hollow needle and guide wire to access a vessel.

An American radiologist, Dr Charles Dotter, altered the course of cardiovascular interventional radiology in 1964 and is considered the father of IR. He modified the Seldinger technique for therapeutic purposes. On 16 January 1964, IR was born when Dotter percutaneously dilated a tight stenosis of a femoral artery, using a plastic tube (catheter), in an 82-year-old lady with painful leg ischaemia and gangrene who refused amputation. Following this, despite scepticism from his surgical colleagues, the leg pain ceased, she started walking and her leg improved. Dr Charles Dotter was nominated for the Nobel Prize in Medicine in 1978.

The term 'interventional radiology', however, was not conceived until March 1967 when an American radiologist, Alexander Margulis, described it in an edition of the American Journal of Roentgenology.

## What skills do interventional radiologists (IRs) have?

IRs have expertise in guiding small needles, catheters and other medical equipment into the body through tiny (5–10 mm) incisions in the skin to treat disease. The treatments performed are truly minimally invasive. However, the basic skills of an IR are still image interpretation and, therefore, core diagnostic radiology is at the heart of interventional radiology training. This combined skill has meant that there is hardly any area of hospital medicine where IR has not had an impact on patient management.

## What can IR treat?

You may be surprised to know the extent of therapies now performed predominantly by IRs. Traditionally surgeons performed a lot of these procedures, although a significant amount of treatments are new and innovative. Virtually all body parts and systems can be treated using IR techniques. However, broad categories of treatments available include:

1. Draining of fluid collections (abscesses, dilated kidneys, pleural effusions)
2. Opening up of blocked tubes (arteries, veins, bile ducts, ureters, fallopian tubes etc)
3. Stopping bleeding from any cause (gastrointestinal bleeding, obstetric and gynaecological bleeding, traumatic bleeding, bleeding after surgery, brain aneurysms, vascular malformations) by occluding the vessels with embolisation
4. Destroying tumours in the liver, lung, kidney by delivering local chemotherapy, embolisation or ablation techniques (such as cryotherapy and radiofrequency ablation)
5. Minimally invasive treatments of thoracic and abdominal aneurysms
6. Preoperative embolisation to improve the safety of surgery.

## Milestones of IR

You may be surprised to learn of the advancements in medicine that have been primarily down to IR innovation. You may not even have known that IR had been involved.

Here are a few milestones of IR

- 1964 Angioplasty
- 1966 Embolisation of spinal tumour
- 1967 Judkins technique for coronary angiography
- 1969 Prototype catheter delivered stent
- 1970s Embolisation coils
- 1972 Embolisation of bleeding gut
- 1973 Embolisation of pelvic bleeding secondary to trauma
- 1974 Selective arterial thrombolysis
- 1977 Embolisation of pulmonary arteriovenous malformations
- 1978 Embolisation of varicoceles
- 1980s Biliary stents
- 1982 Transjugular intrahepatic portosystemic shunts (TIPS)
- 1983 development of balloon expandable stents
- 1990s Treatment of bone and kidney tumours by embolisation
- 1990 Radiofrequency ablation of liver tumours
- 1991 Endovascular stent grafts to treat aortic aneurysms
- 1995 Uterine artery embolisation to treat fibroids (UAE)
- 1999 Endovascular laser therapy (EVLT) to treat varicose veins.

## Patient Safety

IRs pioneered the safe and high-quality procedures and standards for performing minimally invasive therapies, with a concentration on patient safety.

IRs are specialists of radiology, who have completed further education and training in diagnostic radiology and interventional radiology including radiation safety, radiation physics, the biological effects of radiation, injury prevention and clinical practice.

### Can You be referred directly to an IR?

The answer is yes. IR is a progressive specialty and is developing at a fantastic speed. Most IRs offer direct referrals from your GP with no need to be seen by another specialist (traditionally a surgeon). IRs often run outpatient clinics and have access to day-case beds if you need a simple procedure.

IRs typically work as part of a multidisciplinary team within hospitals, so are able to refer you to another team member if it is appropriate. IRs are happy to discuss patient management with your GP if they need advice.

## CONTACT

British Society of Interventional Radiology  
[www.bsir.org](http://www.bsir.org)

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