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Title: IR is a relatively young technology driven specialty. Outline the importance of the development of novel IR technologies and therapies, academic research, and IR registries.

A simple question was posed over fifty years ago which kickstarted the evolution of modern interventional radiology (IR). Could diagnostic imaging tools be used to guide the real-time treatment of disease? Charles Dotter was among the first people to answer this when he successfully performed the first percutaneous angioplasty of a tight localised stenosis of the superficial femoral artery in a patient with painful leg ischaemia in 1964.[1] This progressive concept has since resulted in treatment advances in nearly every organ system.[2] It was apparent that patients could now undergo minimally invasive, targeted procedures by utilising imaging instead of open surgery.[2]

The development of novel IR technologies and therapies since Dotter's breakthrough has been crucial in revolutionising current medical practice. The range of conditions that can be targeted by IR procedures is vast and constantly expanding.[3] In the last decade alone, the development and advancement of arterial stents, stent grafts, embolisation therapies, and venous ablative procedures have exponentially increased the therapeutic possibilities available to patients.[4] IR is even occupying a prominent role in cancer management, with promising new treatments such as transarterial chemoembolisation and percutaneous tumour ablation therapies.[5] These procedures have a high clinical value because they have lower risks, complication rates, and morbidity levels compared to conventional surgery.[6] It also has the added benefit of being more cost-effective.[7]

Active academic research programmes are a pivotal part of IR and key to sustaining its practice. It adds to our present body of knowledge, drives the specialty forward and may eventually lead to the adoption of new technologies and therapies into clinical practice.[8] Research into multimodality image fusion guided procedures, for example, and its potential integration with the spectrum of extended reality might provide an insight into the future of IR.[9] These 'Merged and Mixed Reality' concepts are most suited for medical applications as they allow the user to maintain contact with the physical surrounding environment while interacting with digital objects.[9] This could result in the introduction of 3D holographic reconstruction of organ anatomy that can be used for virtual training purposes and interactive assessments.[9]

IR registries also make up an important part of the specialty. They provide the opportunity to collate and analyse large volumes of data on performance measures of image-guided IR procedures.[10,11] The registry will in turn produce regional and national benchmarks allowing participating facilities and interventionalists to compare their practice performance to and facilitate patient safety and quality improvement efforts.[10,11] This comparative data can also inform healthcare providers about the standards of care received by patients undergoing IR procedures.[10]

Innovation and technology remain the cornerstones of IR. The breadth of changes in IR over the years have forever changed the healthcare landscape by enhancing the practice and understanding of medicine.[2] Further IR research is warranted for the specialty to continue moving forward, and for that an injection of funding and resources are required.[12] Nevertheless, the primary focus of IR should always be centred around the patient, their best interests, and the clinical value of the specialty.

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