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SPECIAL COMMUNICATION

Global Statement Defining Interventional Radiology—Have We Reached the Tipping Point?

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On behalf of the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) and the Society of Interventional Radiology (SIR)

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Introduction

In 2010, spurred by the Royal College of Physicians and Surgeons of Canada's denial of the Canadian Interventional Radiology Association's request for official recognition of interventional radiology (IR) [1], a representative writing group of IR societies around the world developed a consensus statement to define interventional radiology [2]. This initial effort provided a statement setting forth the basic elements of the specialty which apply to interventional radiologists wherever they work worldwide. In the intervening 15 years, much has changed, and a revisit of the definition of interventional radiology is appropriate.

The following is a consensus statement developed by the Cardiovascular and Interventional Radiological Society of Europe (CIRSE; Europe); the Society of Interventional Radiology (SIR; US), the Society of African Interventional Radiology & Endovascular Therapy (SAFIRE; Africa), the Argentine College of Vascular and Interventional Radiology (CARVI; Argentina), the Asia Pacific Society of Cardiovascular and Interventional Radiology (APSCVIR; Asia Pacific region), the Interventional Radiology Society of Australasia (IRSA; Australia and New Zealand), the Austrian Society of Interventional Radiology and Minimally Invasive Therapy (ÖGIR; Austria), the Brazilian Society of Interventional Radiology and Endovascular Surgery (SOBRICE; Brazil), the British Society of Interventional Radiology (BSIR; UK), the Canadian Association for Interventional Radiology (CAIR; Canada), the Chinese College of Interventionalists (CCI; China), the Czech Society of Interventional Radiology (CSIR; Czech Republic), the Georgian Association of Cardiovascular and Interventional Radiology (GACIR; Georgia), the German Society of Interventional Radiology and Minimally Invasive Therapy (DeGIR; Germany), the Greek Society of Interventional Radiology (GSIR; Greece), the Hong Kong Society of Interventional Radiology (HKSIR; China), the Hungarian Society of Cardiovascular and Interventional Radiology (HSCIR; Hungary), the IberoAmerican Society of Interventionism (SIDI; Latin America), the Indian Society of Vascular and Interventional Radiology (ISVIR; India), the Interventional Radiology Division of the Iranian Society of Radiology (ISR; Iran), the Irish Society of Interventional Radiology (ISIR; Ireland), the Israeli Society of Interventional Radiology (ILSIR; Israel), the Italian Society of Medical and Interventional Radiology (SIRM; Italy), the Japanese Society of Interventional Radiology (JSIR; Japan), the Korean Society of Interventional Radiology (KSIR; Korea), the Lithuanian Association of Interventional Radiology (LIRA; Lithuania), the Malaysian Society of Interventional Radiology (MYSIR; Malaysia), the Moroccan Society of Interventional Radiology (SMRI; Morocco), the Dutch Society of Interventional Radiology (NVIR; Netherlands), the Nigerian Society of Interventional Radiology (NiSIR; Nigeria), the Society of Interventional Radiology of North Macedonia (SIRNM; North Macedonia), the Norwegian Society of Interventional Radiology (NFIR; Norway), the Pan Arab Interventional Radiology Society

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Purpose

An updated global statement setting forth the essential elements of IR and continuing challenges facing the specialty.

Background

IR originated within diagnostic radiology and the initial procedures developed formed the basis of a therapeutic subspecialty. Invasive diagnostic procedures such as angiography and cholangiography evolved into therapeutic interventions such as angioplasty and biliary stenting, and now include many more therapies such as embolization, ablation, and thrombectomy as well as endovascular aortic repair. IR therapies have increased in precision and sophistication, and are applied to an increasing spectrum of pathologic conditions for adults and children. The domain of IR continues to grow, and IR has become indispensable to the practice of modern medicine [3–5].

Since 2010, several major shifts have occurred. First, the clinical evaluation and longitudinal care of patients by IR physicians, essential for determining a patient's suitability for treatment and providing management of the patient's underlying disease, has become an integral element of contemporary IR practices, and it has codified into training and certification processes. Second, there has been significant growth in the adoption of IR across the world [6] with a multitude of ongoing outreach and education initiatives for developing countries in Africa, Asia, and Latin America. Lastly, the health-care landscape has undergone substantial change including a focus on multidisciplinary care for complex clinical conditions, emphasis on access to care, and consideration of workforce needs which have brought attention to workforce diversity gaps and introduced allied health professionals into many IR practices [7].

Definition of Interventional Radiology

IR practices around the world continue to vary according to local factors. In some countries, IR remains under the house of diagnostic radiology without subspecialty distinction; in others, IR is recognized as an own subspecialty within radiology; and in the US, IR has been formally recognized as one of the thirty-nine distinct medical specialties [8, 9]. Among others, Japan, Canada, and the UK have achieved subspecialty status [10]. Regardless of local geographic specialty or subspecialty recognition or lack thereof, there are several constant features common to IR throughout the world:

1. Expertise in the clinical evaluation and management of patients suitable for the image-guided therapy across the growing disease states within the domain of IR.
2. Expertise in image-guided minimally invasive therapies.
3. Expertise in diagnostic imaging and radiation safety.
4. Continual invention and innovation of new treatments, devices, and procedures.

Based on these features, IR is unique and distinct from all other disciplines in radiology and all other surgical and medical specialties.

Elements of IR

The following elements define IR:

Clinical Scope

Clinical scope encompasses:

- The clinical evaluation and management of patients with diseases or conditions amenable to image-guided therapy
- The performance and interpretation of non-invasive diagnostic imaging as relevant to the local practice of interventional radiology

[2] The societies listed represent the national and regional interventional radiology societies which have endorsed this statement as of August 30, 2024.

- The performance and interpretation of image-guided therapy as relevant to the local practice of interventional radiology
- The provision of 24-h emergency IR care as relevant to the local practice of interventional radiology

Interventional radiology's scope continues to grow to include minimally invasive image-guided therapy for vascular (including aortic), oncologic, gastrointestinal, hepatobiliary, genitourinary, pulmonary, musculoskeletal, gynecologic, and neurologic conditions in adult and pediatric patients. In the past decade, IR therapies have expanded substantially in interventional oncology, embolotherapy (including treatments for benign prostatic hypertrophy and osteoarthritis), venous disease, and pulmonary embolism.

The interventional radiologist should provide the requisite clinical care for the conditions or disease states in which they perform therapeutic interventions. This can occur within the auspices of a multidisciplinary care team or independently by the IR depending on the local practice in the country where they work. IR practice models may vary: they can work in collaboration with other physicians in multi-specialty practices, as part of a diagnostic radiology group, or independently. Similarly, IR practice locations may be hospital based or free standing depending on the local geographic practice conditions.

Finally, IRs must provide 24/7 emergency IR care to treat IR emergencies such as the embolization of hemorrhage and drainage of infected fluid collections including hydronephrosis and abdominopelvic abscesses. This will usually involve IR work in emergency on-call rotations, which ideally every hospital should provide [11].

Clinical Practice

Since 2010, the requirement for IRs to provide comprehensive clinical care of their patients has become established in interventional radiology practice. Clinical practice for IRs is now recognized by many health systems to be essential for IRs to be able to function at the top of their clinical scope and to optimize patient care and safety.

The clinical practice of IR requires patient care in outpatient clinical facilities, allocated time for consultations, treatment planning, and follow-up [12]. IRs should have admitting privileges for their patients. IRs should perform inpatient rounds on their admitted patients, and any decisions made by IRs should be documented in the inpatient records. Simply put, IR is a patient-facing specialty. There is no aspect of our work that can be accomplished without the direct assessment and continued care of our patients.

The practice of IR requires dedicated and adequate imaging equipment and the requisite tools to perform image-guided therapy. Adherence to radiation safety for patients and staff is of paramount importance as are provisions to allow for local standards of patient monitoring.

Dedicated IR clerical, technical, nursing, advanced practice providers, and radiation safety staff are required. Historically and in most instances, IR practice is combined with diagnostic radiology; however, the past 20 years has seen IR practices become increasingly independent of diagnostic radiology in many countries.

In summary, IRs must be clinicians delivering longitudinal patient care in conjunction with image-guided therapy [13, 14].

Training and Certification

Dedicated, standardized, and regulated IR training programs must include clinical practice training in addition to formal training and assessment in image-guided minimally invasive therapies, diagnostic imaging, radiation physics, and safety. Such training is mandatory in all health systems.

The goal should be to standardize requirements for training programs to ensure that IR training is uniform and consistent regardless of the geographic location of the training provided.

In countries where there is less well-developed IR training, the global IR community has a duty to assist in bringing these programs up to a requisite standard level for the benefit of patients in these countries.

Training in IR must be open to all qualified doctors no matter their gender or ethnicity. Nobody should be discouraged or disadvantaged from pursuing a career in IR based on their sex or ethnic status. Although there is an increased number of females in the IR workforce in many countries, their numbers still lag those of males [15, 16]. Collective, ongoing efforts are required to increase gender and ethnic diversity in IR training programs and ultimately the IR workforce in all countries [17].

Completion of standardized clinical IR training programs must be followed by formal examination of the trainee. The examination ought to be comprehensive in the clinical management of patients and the scope of IR treatments. The examination should be administered by a nationally or locally recognized medical certifying body. Smaller countries may benefit from an internationally organized examination, such as the European Board of Interventional Radiology (EBIR) that is organized by CIRSE. The first EBIR examination was held in 2010, and uptake of this examination continues to increase around the world [18]. Ideally, successful completion of a certifying examination would be followed by a system of continued

maintenance of certification and/or education. Formal acknowledgment by board-certifying organizations (or their equivalent) of IR as a distinct subspecialty of radiology or primary specialty ought to be aspired to and pursued.

Quality and Quality Improvement

IRs must practice lifelong dedication to continuous quality improvement. Local or national IR societies should set forth practice standards, and best practices should be adopted when applicable. As our specialty has grown to treat countless patients around the world, we must endeavor to formal data collection, procedure recording, and analysis of complications and outcomes. IRs must continue to aspire to be leader in the delivery of image-guided therapy [19].

Research

IRs have long been at the forefront of innovation and development of minimally invasive image-guided therapies. Basic, laboratory, and clinical research must be performed according to the internationally accepted principles of ethical research practices and standards of quality. IRs must continue to support innovation proving that outcomes of IR treatments are safe, efficacious, and equivalent or superior to alternative treatment options.

In addition to already published high-quality research IR literature, IRs must continue to investigate the diseases and conditions in which our treatments aim to heal. The development and completion of randomized prospective clinical trials and the collection of large real-world registry datasets should be prioritized. Additional studies, including comparative, safety, and cost-effectiveness studies compared to non-IR treatments, are also needed.

Research is expensive, and the funding for IR research may be provided by national grant awarding bodies or in partnership with industry. IRs should explore all avenues of potential funding to support their research endeavors. Collaborative research in partnership with industry is encouraged if IRs have a major influence on research protocol creation and trial conduct.

Our global IR societies must invest in research training and education. Formal research education and support for clinician scientists within our own ranks is the next challenge for IR around the world.

Professionalism and Workforce Considerations

Safe, high-quality IR practice requires competency in periprocedural, outpatient and inpatient care, often in a collaborative multidisciplinary setting. In many hospitals, IRs are key members of multidisciplinary teams including vascular, oncology, musculoskeletal, trauma, and obstetrics and gynecology. IRs must maintain the best interests of the patient in all clinical interactions, and this can be facilitated by collaboration with other specialties to optimize patient outcomes.

Open disclosure of conflicts of interest (especially financial) to patients, referring physicians, hospital administrators, audiences, and journal referees represents optimal ethical and professional conduct.

In many countries, allied health professionals (AHPs) have become an important component of the IR team; these may include nurse practitioners, radiographic technologists, and physician associates. These individuals undergo additional training to perform important roles for the IR department including minor IR procedures. In general, AHPs should be managed by IRs in the IR department, working with IRs to provide IR services. They should not be employed to work outside these parameters. In countries that employ them, AHPs should have their own regulatory body to ensure that their practice aligns with local and national IR structures. Correctly managed and regulated, AHPs are an asset to IR departments. Efforts must be made to ensure that AHPs are employed and function within these boundaries.

IRs have continued to experience conflicts in some clinical areas with competing specialties for patients. In general, these disputes are harmful to patients and are discouraged. The best way for IRs to continue to provide care for their patients in all clinical domains is to provide optimal clinical practice care, to maintain their expertise in image-guided therapies, and to prioritize communications to colleagues, hospitals, and the general population that IRs are best placed to deliver minimally invasive image-guided therapy.

Global Goals and Challenges for IR

During the Society of Interventional Radiology's (SIR) 2024 Annual Scientific Meeting, IR society representatives from around the world presented on the current state and future directions of IR in their region at the inaugural Global Society Summit. While there were some differences, common themes emerged with the worldwide IR community endorsing the following goals and challenges. These are presented in Table 1.

Summary & A Call to Action

There has been tremendous growth and progress in the field of Interventional Radiology since the original Statement on Global Interventional Radiology in 2010.

Table 1 Global goals and challenges for IR

Goals and challenges	Collaborative opportunities
Adoption of clinical practice by IRs, encompassing evaluation, management, and delivery of longitudinal clinical care	Consistent, unified, global messaging to cement the cultural change transformation from "proceduralist" to clinician
	Promotion and advocacy to hospital systems and DR practices for time and resources required for a successful IR clinical practice
Desire to increase the global provision of IR therapies and the global recognition of IR therapies being safe and effective alternatives to more invasive therapies	Standardized, global clinical practice guidance for IR
	Global messaging to increase the awareness of IR
Desire to increase the education, training, and certification of interventional radiologists worldwide	Standardized, global IR training curriculum
	Standardized options for certification
	Global effort to increase gender and ethnic diversity in IR training programs and the workforce
Need for more high-quality, outcomes focused IR research	Investment in formal research education and support for clinician scientists around the world
Pursuit of IR subspecialty or primary specialty status in every country	Collective support and assistance as individual countries apply for subspecialty/specialty recognition

While the definition of IR and many of the original elements of IR have stood the test of time, there has undoubtedly been a fundamental cultural shift toward identifying and prioritizing the delivery of longitudinal patient care in conjunction with image-guided therapy as the foundational feature of what it means to be an interventional radiologist. The delivery of comprehensive clinical care (i.e., evaluation, management, and therapy) was seen as an important distinguishing factor which led to the primary specialty designation for IR in the US [8]. With the solidification of this clinical focus, the prevalence and growth of IR globally, and the increasing success of countries achieving recognition for IR, it is possible we have reached a tipping point for the specialty, where the next two decades will see formal designation of IR as a distinct subspecialty or as a primary specialty in medicine around the world. To that end, our global IR societies must collaborate closely to advance common strategic goals and must continue to promote the field of IR and the treatments we provide as first options for patients whenever appropriate.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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