



Clinical Services in Interventional Radiology (IR): Advancing Patient-Centred Care



Overview

Interventional Radiology in a nutshell

IR as a cornerstone of modern clinical care

The value of a clinical IR service

- Medical impact
- Economic impact
- Strategic impact



Interventional radiology in a nutshell



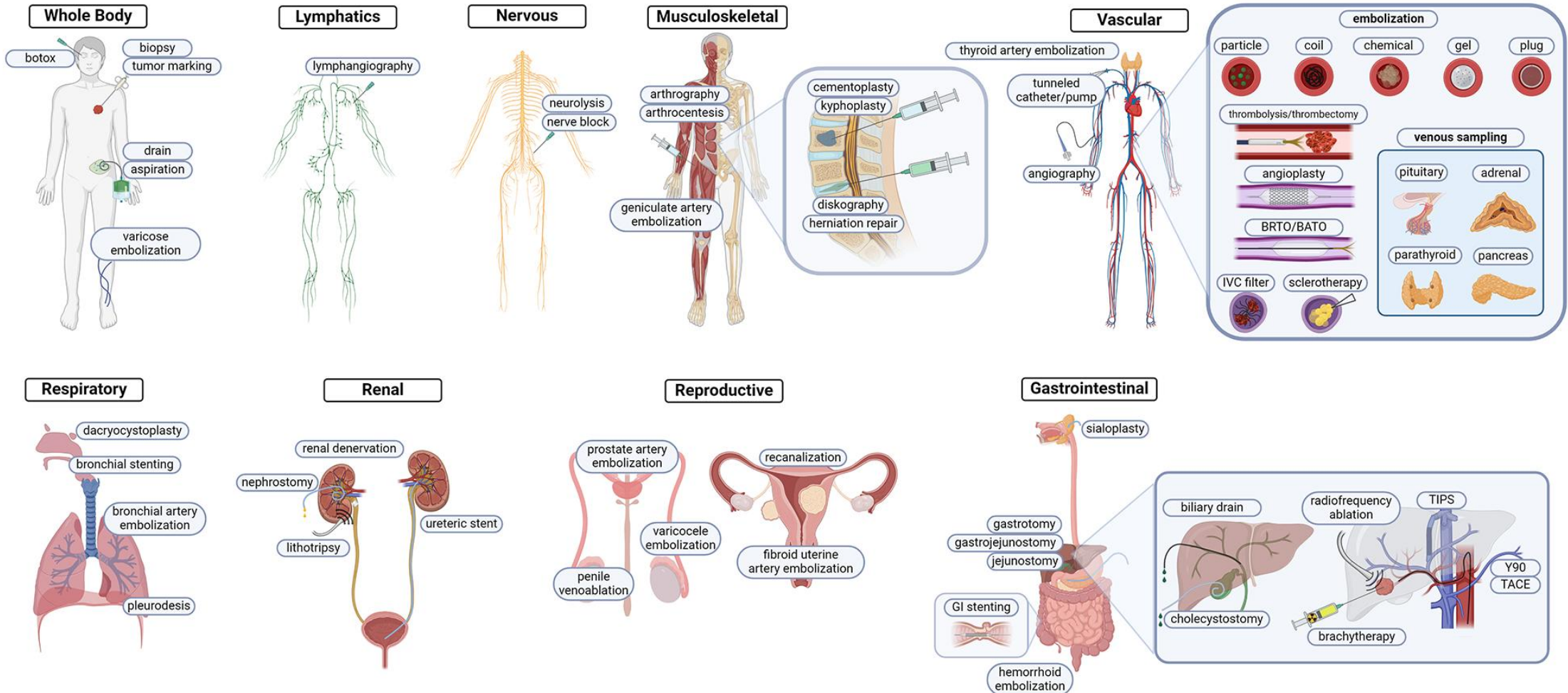
Interventional radiology in a nutshell

- IRs are specialised in **minimally invasive, image-guided treatments** for a wide range of conditions as an **alternative** to traditional treatments.
- Interventional Radiology is one of the most **dynamic, innovative and rapidly growing** areas in medicine.
- IR therapies are suitable for **virtually all parts of the human body**, and an **ever-growing area of indications**.
- Main areas include **vascular procedures and interventional oncology treatments**. The focus may vary depending on local practice, needs and expertise.





Systems and Procedures of Interventional Radiology





IR as a cornerstone of modern clinical care



IR as a cornerstone of modern clinical care

Historical focus:

- IR initially centred around specific procedures requested by specialists
- It is a subspecialty with a treatment focus

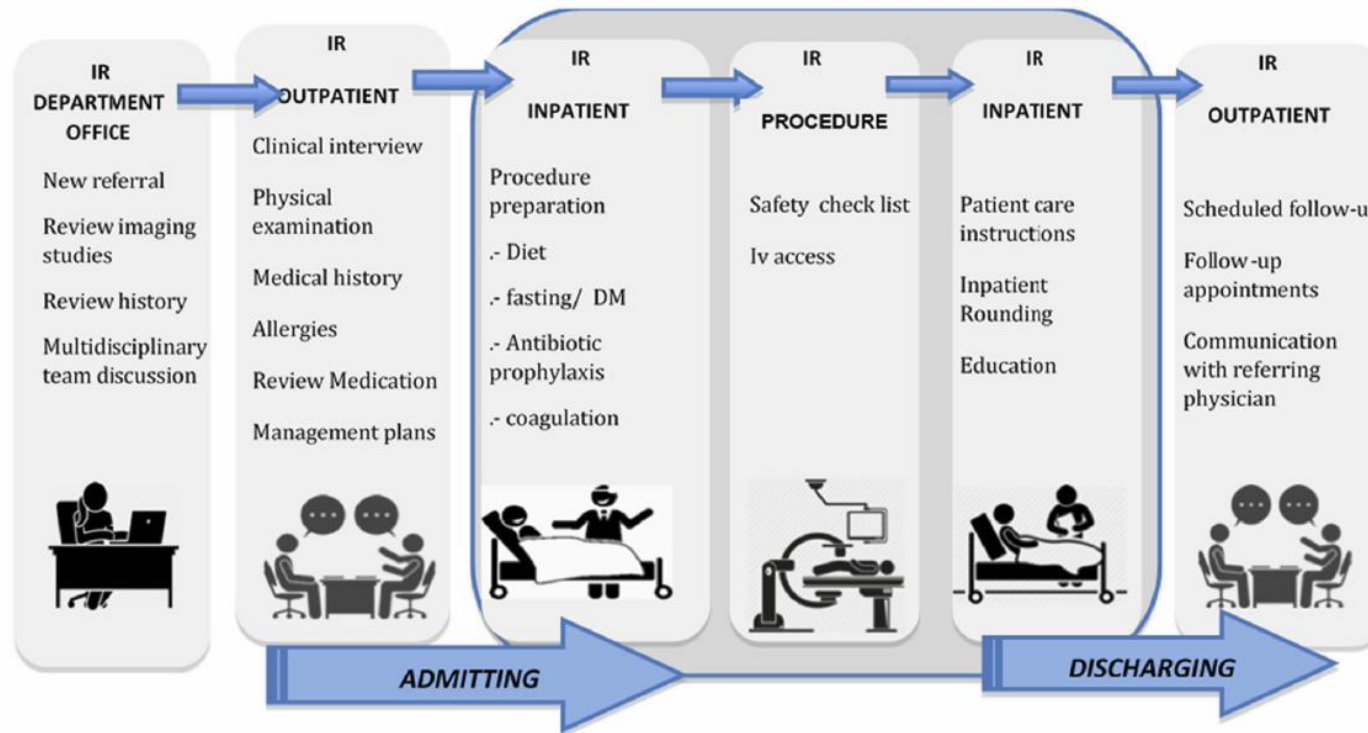
Modern IR practice:

- IR is a fully clinical discipline
- Interventional Radiologists oversee all aspects of patient care:
 - review history, examine patients, diagnose, plan management, and arrange follow-up
 - IR refer to other disciplines as required
- Involving clinical in-patient consultations and out-patient clinics
- Patients are referred directly to Interventional Radiologists
- IRs see patients referred from GPs



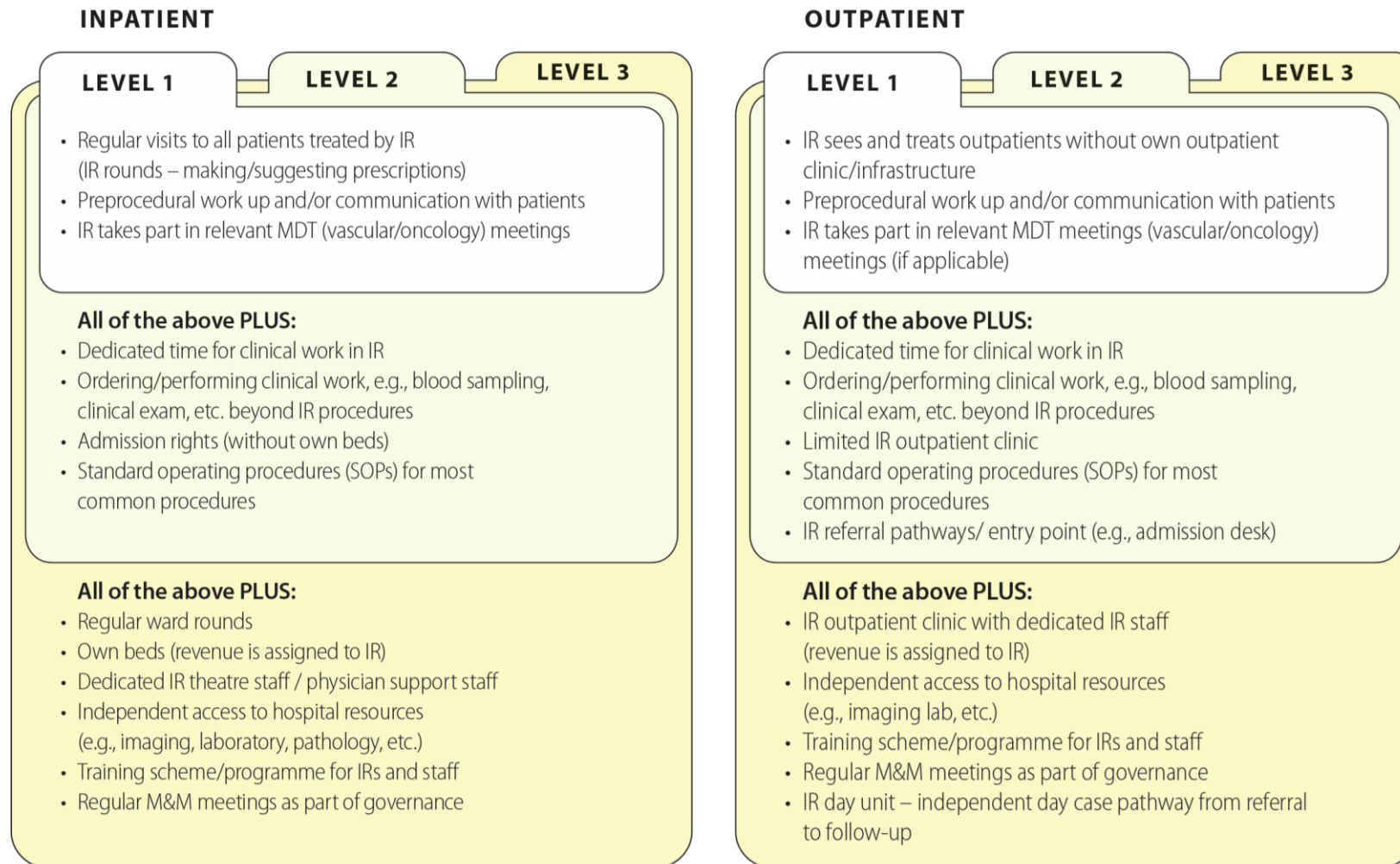
IR as a cornerstone of modern clinical care

The interventional radiologist is responsible for continuity of care throughout the patient journey





Development of clinical IR services: a growth perspective





The value of a clinical IR service

Medical impact



Medical impact



Clinical IR services...

...enhance patient-centred care by promoting effective communication through consultations and improved decision-making

...lead to optimal treatment selection and higher patient satisfaction

...improve access to minimally-invasive treatments

...enable faster diagnosis and therapeutic pathways

...expand therapeutic options for patients

...allow shorter hospitalization times or even ambulatory care



Improving access to minimally-invasive care

- Increasingly, patients express a preference for minimally invasive treatments
- IR is offering multiple minimally invasive alternatives to traditional procedures

Examples:

- Locoregional treatment of malignant neoplasms.
 - Treatment of uterine myomas
 - Treatment of varicocele
 - Treatment of benign prostatic hyperplasia.
- Direct patient access to IR through the out-patient clinics and increased clinical exposure of interventional radiologists results in better access to these minimally invasive procedures

Result: faster recovery => shorter hospitalization times => higher patient throughput



Faster cancer diagnostic and therapeutic pathways

- IR represents an important role in the modern cancer care (Interventional Oncology).
- Plays a pivotal role in expediting cancer diagnostic and therapeutic pathways:
 - Diagnostics: biopsy
 - Therapeutic: local ablations, chemo- and radioembolization...
 - Palliative/supportive care: gastrostomy, ports...
 - Provision of clinical support: Complication management, percutaneous drainages
 - Active participation in Multidisciplinary tumour boards
- Benefits of clinical approach in cancer patients:
 - Faster access to necessary procedures
 - Minimize delays in cancer care
 - Offers patient-centric approach



Expanding therapeutic options for patients

- Supporting the development of clinical IR practice increases the visibility of IR
- Increased visibility and understanding by other clinical specialties of treatments offered by IR expands therapeutic options, particularly for high-risk patients, where IR procedures offer a less invasive alternative to potentially more morbid traditional procedures
- **Examples:**
 - Endovascular aortic aneurysm repair (EVAR) versus open AAA repair
 - Percutaneous tumor ablation versus surgical resection
 - Percutaneous abscess drainage versus open washout
 - Embolization versus surgical packing in abdominal bleeding
- These treatment options may already be available, but could be underutilised due to “low visibility”

Results: improved efficiency, reduced need for intensive care unit (ICU) and high-dependency unit (HDU) admissions



The value of a clinical IR service

Economic impact



Economic impact



Clinical IR services...

... help to optimize patient selection and shorten total treatment times by integrating day-care treatments and outpatient clinics

... reduce the pressure on inpatient beds

... streamline pathways and facilitate efficient interventions

... allow to offer a wider range of treatment options

... thereby increase overall patient throughput

... and optimise hospital resources through fiscal accountability



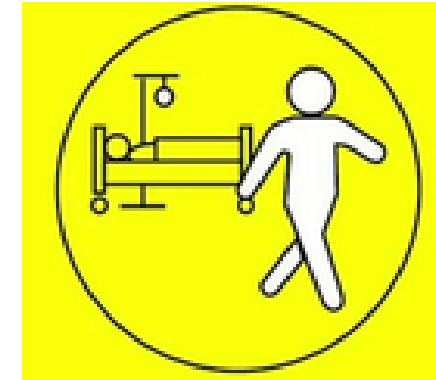
Transforming towards a clinical IR service

- **Clinical IR transformation has many benefits:**
 - Shortening the patient treatment times=higher patient throughput*
 - Optimising hospital resources
 - Improving patient-centred care with personalised medicine in a modern hospital
- **However, it may represent initial re-organisation and investment :**
 - People - dedicated IR staff (incl. nurses, radiographers, administrative staff)
 - Space - clinic room, IR day unit, IR ward
 - Time - dedicated time for IR clinical activity



Increasing day-case procedures

- Clinical practice in IR facilitates the performance of a vast majority of treatments on a day-case basis
- Higher patient turnover with fewer complications¹
- Minimally invasive IR procedures performed under local anaesthesia and sedation are ideally suited for day case pathways
- IR can be combined with other treatments or may offer additional therapeutic options





Increasing day-case procedures

- IR allows for a broad range of service lines (table)

Results:

- Efficient resource utilization: Day case procedures reduce pressure for inpatient beds
- Cost savings: Reduced in-patient bed stay lead to substantial cost savings²
- Enhanced patient satisfaction: Patients benefit from faster recovery and improved quality of life^{3,4}

Table 1. Outline of Potential IR Service Lines and Relevant Procedures

Service Line	Procedures
Oncology	
• Lung cancer	Thermal ablation
• Liver cancer	Ablation, transarterial chemo-radioembolization
• Renal cancer	Ablation
Women's health	
• Fibroids	Uterine artery embolization
• Infertility	Fallopian tube recanalization
Peripheral arterial disease	Vascular lab, PTA, endovascular stent, endovascular stent-graft
Vascular malformations	
• High flow	Embolization/sclerotherapy
• Low flow	Embolization/sclerotherapy
• Pulmonary	Embolization
• Venous insufficiency	Laser/sclerotherapy
Pain management	Vertebro-/kyphoplasty, epidural steroid injection, nerve block, facet joint injections, nerve ablation
Cerebrovascular disease	
• Stroke	Neurovascular rescue
• Occlusive disease	Angioplasty/stent

2 - Makris GC. Et al., Clin Radiol. 2016 Jul;71(7):716.e1-6.

3 - Cazzato RL et al., Cardiovasc Intervent Radiol. 2021 Jan;44(1):118-126.

4 - Lutjeboer et sl., Cardiovasc Intervent Radiol. 2015 Jun;38(3):543-51.

Beheshti M.V. et al., J Vasc Interv Radiol 2012; 23:1181–1186



Exemplary business case: Osteoporotic fracture management

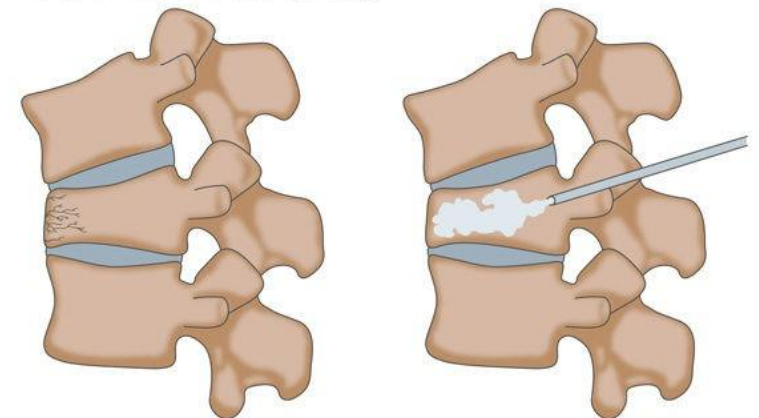
Why it matters:

- **Osteoporotic vertebral fractures (OVFs)** lead to severe pain, immobility, and extended hospital stays.
- **IR procedures** like vertebroplasty and kyphoplasty offer rapid pain relief and quicker mobilization.
- **Minimally invasive**, often performed as day-case or short-stay procedures under local anesthesia.
- **Reduces opioid use**, complications, and long-term care burden.

Clinically effective and efficient, especially beneficial for elderly patients.

“Kyphoplasty significantly shortens hospital stay and improves early mobility¹.”

Percutaneous vertebroplasty



1. Vertebral fracture

2. Cement injection



Exemplary business case: Osteoporotic fracture management

Historically:

- Elderly patients with spinal fractures admitted for **7–10 days**.
- Managed conservatively: high pain scores, prolonged rehabilitation, high cost (~€4,000–6,000 per admission)¹.

After introducing IR vertebral augmentation:

- Same-day or next-day procedure.
- Discharge within **24–48 hours**.
- Cost per case: ~€2,000–3,000¹.

Estimated savings: €1,500–3,000 per patient¹.

- Higher throughput, better outcomes, lower readmission rates.

Bed-day savings, improved patient satisfaction and revenue opportunity



Exemplary business case: venous access

Why it matters:

- **Steady increase in the use of totally implantable venous access devices**, i.e. for oncologic but also other patients
- Minimally invasive placement under image guidance since the 1990s, related to lower costs and shorter operating times, higher technical success rates and reduced morbidity.
- **Large comparative studies of costs and outcomes of surgical vs IR placement** ^{1,2}:
 - Overall mean costs for chest port insertion were significantly higher in the OR, for both room and pharmacy costs
 - Lower rates of adverse events and follow-up procedures for IR
 - Significant differences in insertion cost suggest more cost-effective IR placement than surgical placement without affecting quality

1 – Martin B., et al, J Vasc Interv Radiol 2022; 33:1184–1190

2 - LaRoy J.R., et al, J Am Coll Radiol 2015;12:563-571.



Competitive advantages of IR clinics

- Effects of establishing an IR clinic¹
 - Increase volume of patients
 - Reduce avoidable costs
 - Improve efficiency of machines used
- By proper selection an HCP can add profitable IR services to their portfolio



Competitive advantages of IR outpatient clinics

- Outpatient IR clinics are key to assessing patient suitability for procedures
- IR clinic appointments ensure appropriate counselling, informed consent and follow-up
- **Advantages of IR clinics:**
 - Resource optimization by appropriate patient selection and therefore avoiding cancellations
 - Streamlined patient pathways from admission to discharge report
 - Continuity of care by responsible IR clinician enhances overall patient experience
 - Appropriate post-procedural care and identification of potential complications
 - Improved patient satisfaction¹



Competitive advantages of IR outpatient clinics

- IR offers easy access to advanced treatment options via outpatient clinics
- Embracing IR practice provides a competitive advantage by offering a wider range of services

Example: Prostate artery embolization¹

- minimally invasive procedure for the treatment of the Benign prostate hypertrophy (BPH).
- Expands the array of options for the treatment of BPH (medical and surgical)
- Physicians can tailor BPH treatment for individual, according to their preferences

Result: Healthcare providers offering a wider range of treatment options attract a higher volume of patients seeking cutting-edge therapy. In addition, the recruitment and retention of highly skilled medical professionals is improved.



Fiscal accountability

- **Budget Accountability:**
 - Departmental budget control leads to better resource utilisation.
 - Departmental budget control leads to proactive cost management.
 - Departmental budget control motivates improved billing.
- **Fiscal Discipline:**
 - Budget control leads to enhanced fiscal discipline



APA PsycArticles: Journal Article

Antecedents and consequences of psychological and team empowerment in organizations: A meta-analytic review.

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Seibert, S. E., Wang, G., & Courtright, S. H. (2011). Antecedents and consequences of psychological and team empowerment in organizations: A meta-analytic review. *Journal of Applied Psychology, 96*(5), 981–1003. <https://doi.org/10.1037/a0022676>

*„A meta-analysis found that **empowering employees by delegating authority and decision-making** can lead to positive outcomes, including improved financial performance, when done correctly“*



The value of a clinical IR service

Strategic impact



Strategic impact



Clinical IR services...

... increase efficacy of interdisciplinary decision-making

... expand treatment options for other disciplines with reduced complication rates and improved outcomes

...saves lives in emergency cases

... improve efficiency, reduce transfer costs, keep complex emergencies in-house, and enhance centre reputation when offered on a 24/7 basis



Increased efficacy of interdisciplinary decision making

- IR clinical practice increases visibility of the hospital and trust among other clinical specialties
- Increased visibility can enhance the integration of IR into the broader healthcare landscape
- This fosters interdisciplinary communication and collaboration, providing a more streamlined approach to patient care

Results:

- Optimising patient treatment pathways
- Better patient care
- More efficient resource allocation





IR Enabling Complex Surgery: The Case of Pancreatic Surgery

Pancreatic surgery depends on IR support to ensure safe outcomes:

- **Post-op complications** (abscesses, hemorrhage, bile leaks) are often managed non-operatively with IR
- IR procedures like **percutaneous drainage** and **embolization** reduce the need for reoperation
- **Pre-op IR interventions** (e.g. portal vein or biliary stenting) enable resectability
- Minimally invasive IR options lower morbidity, shorten recovery, and improve patient flow
- Additional treatment options for non-surgical candidates and additional revenues for the HCP— e.g.

Electrochemotherapy

IR expands treatment options, reduces complications, and improves outcomes

“21/24 major post-op complications were successfully treated with IR.

Reoperation rate: just 2.5%.”

— *Pandanaboyana et al., HPB (Oxford), 2013*



HPB
Volume 14, Issue 12, November 2012, Pages 812-817



Original Articles

The role of interventional radiology in the management of surgical complications after pancreateoduodenectomy

Pandanaboyana Sanjay¹, Maximiliane Kellner¹, Iain Stephen Tait¹

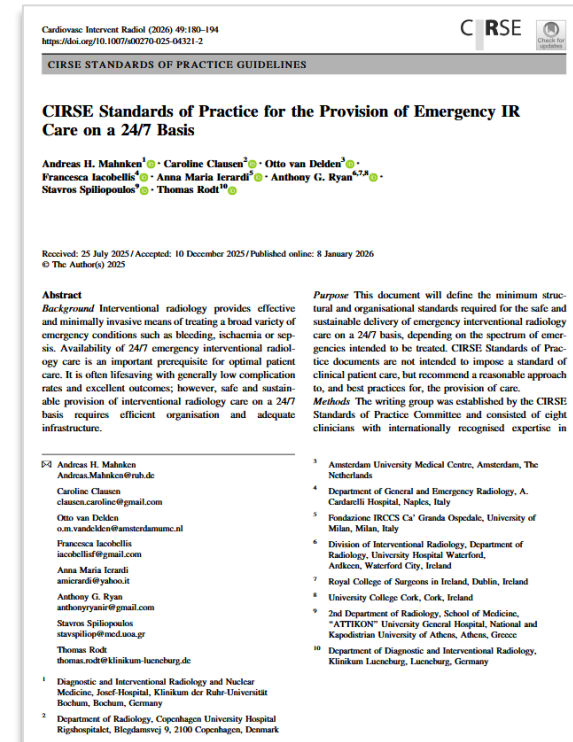


Emergency IR: 24/7 care saves lives

IR is essential in life-threatening emergencies¹:

- **Haemorrhage control:** GI bleeding, trauma, post-partum haemorrhage
- **Infections:** Urgent drainage of abscesses, obstructed kidneys
- **Ischemia:** limb salvage in critical limb ischemia
- **Stroke:** Mechanical thrombectomy for large vessel occlusion
- **Aneurysms:** Endovascular repair of ruptured aortic aneurysms

Available 24/7, IR improves survival, avoids ICU stays, and reduces complications^{2,3}



- 1- Mahnken A., CVIR, 2026
- 2 - Uberoi R; Interventional News, 2016
- 3 - Chung R, CVIR Endovasc 2018



Why Hospitals Need 24/7 IR Coverage

Administrative case for round-the-clock IR:

- **Meet regulatory standards:** Required for trauma & stroke center status
- **Improve efficiency:** Fewer emergency surgery, shorter hospital stays
- **Reduce transfers:** Keeps complex cases in-house
- **Strategic value:** Builds reputation as a centre for comprehensive hyperacute and acute care
- **Patient safety:** Availability of an 24/7 IR service saves lives¹

Investing in 24/7 IR = improved outcomes + cost savings + strategic advantage



More resources on Clinical Services in IR

Visit www.cirse.org/clinicalservices

