Interventional Radiology: what we do.
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What is an Interventional Radiologist?
Newest recognized medical specialty
Separate from diagnostic radiology
6 years of post-graduate medical training:
- Clinical internship (1 year)
- Diagnostic and Interventional radiology residency (4 years)
- Interventional radiology fellowship (1 year)

What is Interventional Radiology?
Diagnostic Radiology trained (head to toe)
- Image interpretation (including prior studies)
- Image consultation and protocolling
- Disease process management
- Recommended follow up (imaging, physician, etc.)

Interventional Radiology additional training (head to toe)
- Pre-operative consultation
- Image interpretation (including prior studies)
- Procedure
- Diagnostic (minority) & therapeutic procedures
- Post-procedure care

Benefits:
- Decreased cost & post-procedural care
- Decreased morbidity & mortality
- Faster recovery
- Only Option
IR: tools of the trade.

- Needles
- Guidewires
- Catheters
- Contrast Agents
- Drainage catheters/tubes
- Stents
- Angioplasty Balloon
- Many, many more

Tools: Access Needles

IR: tools of the trade – Seldinger technique
**Tools: Guidewires**

- Material
- Thickness
- Stiffness
- Length

**Tools: Catheters**

- Material
- Thickness
- Stiffness
- Length
- Flow rate

**Tools: Contrast Agents**

- Iodinated Contrast
- MRI (Gadolinium) Contrast
- Carbon Dioxide (Gas)
### Tools: Drainages catheters/tubes

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<th>Type</th>
<th>Material</th>
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### Tools: Stents

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### Confusing...

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Quick history.

1927 – First angiogram (Egas Moniz)
1964 – First angioplasty (Charles Dotter)
   “Father of interventional radiology”
1966 – Embolization of tumors
1967 – Coronary angiography (Melvin Judkins)
1969 – First stent deployed
1980 – Biliary interventions
1982 – Interventional Urology
1991 – Abdominal aortic stent grafts
What is an Interventional Radiologist?

Like a surgeon taking consultations.

Diagnostic radiology interpretations guide procedure (head to toe).

Pre-, intra-, and post-procedure care.

Wide variety of practices.

E.g.

Ultrasound guided abscess drainage.

Fluoroscopic guided arteriogram and embolization.

IR CONTINUUM

Image

Access

Diagnose/Treat

Manage

IR CONSULT?
Common IR Practice
Access and Diagnose/Treat (head to toe):
- Vascular
- GI
- Urologic
- Gynecologic
- Hepatobiliary
- Trauma
- Liver Disease
- Pain management
- Oncology
- Cosmetic

Interventional Procedures for Diagnosis

Biopsy and Drainage
Sentinel IR procedures that started it all.
Usually performed by the Body Imaging Service.
IVC filters and Pulmonary Embolism Thrombolysis

Inferior vena cava filter barrier that allows blood flow through the IVC, but does not allow large clots

Break up large volume clots in symptomatic and unstable patients
Nephroureteral Obstruction

Relieve mechanical obstruction
Ureteral stricture dilation
Urinary diversion
Stone removal
Percutaneous Biliary Intervention

- Cholangitis
- Bile duct strictures
- Pancreaticobiliary malignancy
- Repair of surgical injury
- Biliary stones

Interventional Radiology: what we do.
Arterial Injury and Flow Limitation

- Trauma
- Post Operative
- GI bleeding
- Atherosclerotic disease
- Vascular compression
- Anticoagulation related
Example Case: Vascular Malformation

Vascular Malformations

Portal Hypertension: Ascites and Variceal Hemorrhage
Musculoskeletal and Pain Interventions
Why Interventional Oncology?

- Many patients are medically inoperable
- Surgical, regional, and systemic salvage
- Low risk, less expensive, and quick recovery
- Test of time for potentially under staged patients
- Synergistic (not an either/or situation)
- Repeat therapy is well tolerated
- Palliation

EVIDENCE IS GROWING

Percutaneous Ablation

- Radiofrequency
- Cryoablation
- Microwave
- Irreversible Electroporation
Endovascular Oncology

- Transarterial Chemoembolization
- Drug Eluting Bead Chemoembolization
- Radioembolization
- Bland Embolization
- Intravascular ethanol
- Percutaneous Hepatic Perfusion
- Portal Vein Embolization

Bland Embolization

Removal of tumor blood supply alone, typically with bland particles

Embolization of benign disease for bulk reduction and symptom control (ex. uterine leiomyomata)
**Drug Eluting Bead Chemoembolization (DEBTACE)**

Chemotherapeutic agent is adsorbed to flexible particles that impregnate tumor vascular supply.

Several studies have indicated an overall survival benefit for unresectable HCC as well as reduced liver toxicity and drug related adverse events.

More permanent and aggressive embolic agent which may make up for less total chemotherapeutic dose.

Extended antibiotic prophylaxis for incompetent biliary system or severe liver disease.

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**Radioembolization**

External beam radiation therapy is challenged by the sensitivity of normal liver radiation.

Hepatic treatment dose estimated from 50-70 Gy while the liver tolerance dose is 35 Gy.

Selective intra-arterial yttrium-90 beta emission enables doses over 120 Gy without liver toxicity.

Well tolerated, single session, outpatient treatment.
Multifocal Liver Involvement

Radioembolization

Point Source Brachytherapy within target organ: effective (3-12 mm margin)

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Pre Y-90 (Tc-99m MAA)

Post Y-90 (Bremsstrahlung)

Cosmetic IR

Varicose vein ablations
Laser liposuction
What is an Interventional Radiologist? Recap.

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Questions?

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THANK YOU

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