

Purpose

- Provide a categorization schema for volumes of different IR techniques that is applicable across a wide variety of IR training programs.

Background

- Scope of practice is broad, training new residents can pose many challenges and vary tremendously based on caseload and the purview of the IR department
- ACGME collects data on number of cases performed by residents, however, this data is not publicly available for further evaluation and the methodology for generation of minimum study volumes is nebulous at best
- Other integrated training programs for procedure based subspecialties, like vascular and thoracic surgeries, have specific case log categories and required case volumes

Methods

- Retrospective data analysis at a single level one trauma, tertiary care academic medical center, that reviewed the number of different cases performed by IR residents from 2014–2022
 - Procedural data extraction by in house analytics institute that was subsequently de-identified
 - Study report data extraction from Nuance-mPower Dartmouth radiology reporting database
- Combination of this data and pre-existing IR society recommendations
 - (1) Propose a new categorization schema to ensure an adequate exposure to a variety of techniques
 - (2) Suggest minimum case volumes that should be completed during training to obtain technical competence

References

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Results/Figures

CASE LOG CATEGORY (12)	REQUIRED MINIMUM
Aortic Stent Grafting	TBD
Arterial PTA or Stent	TBD
Dialysis Access Intervention	TBD
Embolization	TBD
New Outpatient Clinic Evaluation	TBD
Primary GI Intervention (PTBD, Cholecystostomy, Gastrostomy)	TBD
Primary Nephrostomy	TBD
Thrombolysis or Thrombectomy (Arterial or Venous)	TBD
TIPS or TIPS Revision	TBD
Tumor Ablation	TBD
Venous Port	TBD
Venous Intervention (Stent, PTA, or filter)	TBD

Figure 1: Current ACGME categorization for required case log.

	IR Trainee Averages	SIR Training Guidelines	Proposed Minimum Case Volumes	Example Procedure(s)
Total	1357	1000	1000	
Arteriography w/ Angioplasty		50	50	Peripheral arteriogram w/ angioplasty
Arteriography w/ Stent Placement	80	25	25	Peripheral arteriogram w/ stent placement
Arteriography w/ Embolization	64	50	50	GI bleed embolization, hepatic tumor embolization
Arteriography w/ Thrombectomy	15	30	30	Cerebral arteriogram w/ mechanical thrombectomy
Diagnostic Venography	15		10	Adrenal vein sampling
Venography w/ Venoplasty			20	Fistulagram w/ venoplasty
Venography w/ Stent Placement	23		10	Fistulagram w/ venous stent placement
Venography w/ Ablation	11		10	Varicose vein ablation
IVC Filter Placement	22		20	IVC filter placement
TIPS De-Novo or Revision	21		20	TIPS
Central Venous Access and Removal	227	200	200	Dialysis access, port placement, PICC placement
Fluoroscopically Guided Biopsy or Drain Placement	105		100	Transjugular hepatic biopsy, gastrostomy
CT Guided Biopsy or Drain Placement	111	50	100	Pulmonary nodule biopsy, retroperitoneal abscess drainage
US Guided Biopsy or Drain Placement	387		200	Percutaneous hepatic biopsy, thoracentesis
Fluoroscopically Guided Lumbar Puncture or Vertebroplasty/ Augmentation	13		15	Lumbar puncture, vertebroplasty
CT Guided Ablation	32		30	Hepatic radiofrequency ablation, pancreatic IRE
Lymphangiography w/wo intervention	1		1/0	Lymphangiogram
Manipulation of Existing Catheters	243		100	Drain exchanges, drain removals
Recanalization	3		5	Ureteroplasty
Foreign Body Retrieval	6		5	IVC filter removal

Discussion

- Breakdown will ensure adequate exposure to a wide variety of procedures while still allowing one to complete non-procedural clinical duties as well as having time to study outside of the hospital and participate in research projects
- Standardized criteria for procedural volumes expected by the time of graduation would allow for further standardization of training across various institutions, independent of the local caseload
- Institutions that do not currently have an IR training program would be able to evaluate their case volumes and determine if they have the capacity to support the following:
 - Integrated IR residency program
 - ESIR program
- Three key categories in which there is the most variation including interventional neuroradiology (INR), peripheral arterial disease (PAD) management and pediatric IR
- Ongoing growth in the number and scope of interventional subspecialties
- Propose that ACGME amend their current case logging system to have more granularity and specificity or a separate organization, which already has some pre-existing guidelines could adopt a case logging system
 - Residents and institutions could access in an attempt to make the process clearer over the course of training

Conclusion

- Our minimum case requirements schema has specific case volumes and categories that are specific, yet provides a range of procedures that employ the same technique.
 - This technique-based categorization may permit target volumes to be established that are achievable for all IR departments at different institutions.
- Similar in number of categories compared to the current ACGME classification system will allow for easy adoption of our model and it will be applicable to all IR departments at various institutions that have different procedures within their purview.

Figure 2: DHMC resident volume averages, SIR training recommendations for different techniques, our proposed minimum case volumes, and example procedures that fall within each category are included. (*) indicates rare procedures that trainees should have exposure to if possible at a given institution.