HONG KONG COLLEGE OF RADIOLOGISTS

Higher Subspecialty Training in Vascular & Interventional Radiology

[This document should be read in conjunction with ***the Guidelines on Higher Specialist Training (Radiology***)]

1. INTRODUCTION

1.1 The training should cover both common aspects of angiographic and interventional radiological procedures.

1.2 Vascular & interventional radiology (IR) involves diagnostic as well as therapeutic procedures. Its minimally invasive nature with inherent risks and benefits to patient should be appreciated. Emphasis is placed on clinical indications, patient safety, technical competence & patient management. Attention to radiation safety should be made with prolonged fluoroscopic time. A high degree of alertness should be exercised to avoid or minimize possible complications. Correct decision-making could only be learned through appropriate training, close supervision/guidance and practical hands-on experience.

1.3 The program is listed under Category A of Higher Training by the Hong Kong College of Radiologists.

2. OBJECTIVES

2.1 General objectives

Completion of Vascular and interventional radiology (IR) higher training should equip a trainee with a, an added knowledge base of IR over and above that of general radiology training, b, capability of independently exercising clinical skill related to basic IR procedures including but not limited to preprocedural workup, practical procedural skill, postprocedural management and management of some complications, c, experience in advanced IR procedure as an observer OR parts of a procedure under strict supervision

2.1.1 Trainee is expected to learn professional values and required standard of behaviour in IR clinical practice. To understand broad principles and the use of aseptic techniques associated with IR procedures;

2.1.2 To have in-depth understanding of indications, contraindications, pre procedural work up, after care for standard IR procedures;

2.1.3 To be able to evaluate IR procedures with respect to other imaging diagnostic and clinical management options;

2.1.4 To be able to set priorities in time-critical management strategies;

2.1.5 To be aware of the practice of informed consent and medico-legal implications of IR procedures;

2.1.6 To understand cost and cost-effectiveness related to IR procedures;

2.1.7 To understand the importance of radiation protection as applied to IR procedures.

2.1.8 To understand the concept and practice of conscious sedation, and the Hong Kong Academy of Medicine Guidelines on Procedural Sedation.

2.2 Procedure-related objectives

2.2.1 To have exposure to a wide spectrum of angiography, venography, vascular non-vascular interventional procedures, musculoskeletal intervention;

2.2.2 Develop an appropriate image guided clinical and therapeutic strategy for MOST (not all) of the following clinical scenarios: Trauma, haemorrhage, sepsis, luminal stenosis/obstruction, vascular stenosis/occlusion, thromboembolic disease, vascular and lymphatic pathology, benign and malignant tumours, post-operative conditions, iatrogenic conditions.

Develop an appropriate image guided clinical therapeutic strategy for IR related to MOST (not all) of the following specific body systems: Gastrointestinal, Gynaecological, Hepato- pancreatico- biliary radiology and spleen, paediatric radiology, thoracic, urogenital, musculoskeletal and vascular radiology.

2.2.3 To be familiar with commonly used drugs, drugs used in conscious sedation, patient monitoring equipment and resuscitation procedures;

2.2.4 To know proper handling, use and deployment of common IR devices and accessories;

2.2.5 To be able to advice on patient preparation and post-procedural care;

2.2.6 To be able to write up procedural record and to interpret and report on results of examination / procedure being performed;

2.2.7 To have an understanding of potential complications and proper method of managing complications.

2.2.8 Pre-procedural counselling to patient and relatives in a clinic setting is desirable, especially for newly-introduced procedures and high risk procedures.

3. TRAINING REQUIREMENTS

3.1 <u>TRAINING CENTRE REQUIREMENTS</u>

3.1.1 The training centre must be equipped with CT, ultrasound, fluoroscopy and DSA facilities.

3.1.2 A comprehensive stock of medical devices for IR must be available. This may be in-house stock as consignment to the department, or be readily available from supplier's store in a reasonably short time interval, which does not affect the management of patients. Common medical devices for urgent intervention must be available.

3.1.3 Appropriate drugs, patient-monitoring equipment, resuscitation facilities must be available in procedure rooms.

3.1.4 Scrub up facilities must be available.

3.1.5 24-hr. emergency resuscitation, medical and surgical teams must be available.

3.1.6 24-hr. on-call IR service must be available.

3.2 TRAINER AND SUPERVISION REQUIREMENT

3.2.1 Trainer requirement

The trainer requirement is specified in the Guidelines on Higher Specialist Training (Radiology).

3.2.2 Supervision requirement

The trainee may participate in the procedure as an observer, an assistant operator, operator under direct supervision and operator under indirect supervision.

For Basic examination performed independently, the trainee must have fulfilled the following requirements.

(i) At least 50 numbers of basic level procedure should be performed under direct supervision.
(ii) The supervisor and the training head should feel satisfied about the safety profile and competency of the trainee in subsequent procedures.
(iii) A trainer must be available to provide necessary guidance.

3.3 DURATION OF TRAINING

3.3.1 A 3-month training is acceptable for fundamental understanding and exposure in Interventional Radiology. A training duration of 6-9 months is desirable for acquiring more in-depth Interventional Radiology knowledge and technique.

3.4 DUTY SESSIONS

3.4.1 Five or more service sessions weekly specific for the subspecialty are required.

3.4.2 Trainees should attend to emergency IR procedures during on-call duties.

3.5 MINIMUM NUMBER OF EXAMINATIONS REQUIRED

3.5.1 In a 6-month training period, a trainee is expected to have:

(a) Performed not less than 150 numbers of basic level examinations, which consist of a minimum of 50 nonvascular (including at least 20 image-guided drainage and at least 20 image-guided fine needle aspiration/ biopsy) and 50 vascular examinations (including at least 10 coeliac arteriogram, 10 superior mesenteric arteriogram, 6 renal arteriogram, and 6 pelvic arteriogram). *
(b) At least 25 nonvascular and 25 vascular examinations should be performed under direct supervision.
(c) Assist or perform not less than 80 numbers of advanced level examinations, which consist of a minimum of 30 nonvascular (including at least 6 percutaneous transhepatic biliary drainage, 6 percutaneous cholecystostomy, 10 percutaneous nephrostomy) and 30 vascular examinations (including 10 embolization, 6 IVC filter placement and 10 central venous catheter placement). *
(d) All performed advanced level examinations should be performed

under direct supervision.

(e) Observe or assist at least 2 thermal ablation of tumor (including microwave, radiofrequency or cryoablation), 6 dialysis fistulogram, 6 percutaneous transluminal angioplasty, 2 vascular stenting, 2 neurointervention and 2 stent graft of aorta.

(f) Observed surgical or laparoscopic operations (Optional).

(g) Observed interventional endoscopy (Optional).

(h) Observed MR guided interventional procedures such as biopsy or ablation (Optional)

(i) Observed paediatric interventional procedures (Optional)

(j) Performed post-procedural ward follow up within 24 hours for at least 20 patients in advanced level*[See appendix 1]. It should be recorded in the training logbook.

(k) To report on 12 CT angiogram or MR angiogram.

3.5.2 The trainee should be able to complete the minimal required number of basic examination in his/her own centre. For advanced procedures, arrangement to observe, assist and operate in the other recognized Higher Training Centre in Hong Kong is allowed, especially when there is a deficiency in certain specialized area of Vascular and IR in his/her own centre. This should be clearly recorded in the training record.

3.5.3 *Definition of skill levels:

Although there is wide variability in the technical and clinical complexity of individual interventional procedures including the associated risks depending on patient factor, for training purpose broad categorization is still possible.

3.5.3.1 Basic level procedures

This includes those relatively low risk procedures that are expected to be achievable by most trainees; and those angiographic or interventional procedures with lower risk involved.

3.5.3.2 Advanced level procedures

This includes those technically demanding procedures, with likely risk for those who are not familiar with the procedures, or with possible serious risks even if performed by experience personnel.

3.5.4 To facilitate use of Radiology Information System to track procedures performed, workload codes would be employed. Only codes listed within the table to reflect more common or standard procedures will be counted for training purpose.

Procedures	RIS Workload Codes
Basic examinations	6102 Aortogram 6103 Pelvic arteriogram 6104 Peripheral arteriogram 6107 Subclavian arteriogram 6108 Coeliac arteriogram 6109 Superior mesenteric arteriogram 6110 Inferior mesenteric arteriogram 6111 Renal arteriogram

Procedures	RIS Workload Codes
	6134 Both lower limbs angiogram – bolus chase 6202 Jugular venogram 6203 Pulmonary angiogram 6204 SVC/subclavian venogram 6205 IVC venogram 6206 Renal venogram 6208 Gonadal venogram 6209 Direct portography 6210 TIPSogram 6211 Peripheral venogram 6212 Dialysis fistulogram 7103 – 7107 Image-guided fine needle aspiration or biopsy 7108 – 7109 Image-guided drainage 7206 Revision of biliary catheter 7209 Biliary manometry 7299 Others e.g. plug liver biopsy tract 7308 Ureteric catheter revision
Advanced examinations	2401 Lymphogram 6105 Cerebral arteriogram 6106 Vertebral arteriogram 6113 Spinal arteriogram 6114 Bronchial arteriogram 6117 Laser angioplasty/rotablation, not PTCA 6301 Embolisation, chemoembolisation, Radioembolisation, Lipiodol angiogram 6301.AV Portal vein embolization for hepatectomy 6302 Percutaneous transluminal angioplasty 6303 Vascular stenting 6304 Thrombectomy 6305 Thrombolysis 6306 Intravascular foreign body retrieval 6307 Venous sampling 6308 IVC filter placement 6309 Central venous catheter placement 6310 Transjugular intrahepatic portosystemic shunt (TIPS) 6311 Neurointervention 6312 Aortic fenestration (inclusive of all necessary stenting) 6313 Stent graft for aorta 6316 Percutaneous vascular lesion ablation (transarterial or transvenous) 6325 Stripping of fibrin sheath of HD catheter 7201 Percutaneous transhepatic cholangiogram 7202 Percutaneous transhepatic biliary drainage 7203 Biliary endoprosthesis insertion / biliary internalisation Biliary stenting (insertion or extraction) 7204 Biliary tract dilatation >14 Fr

Procedures	RIS Workload Codes
	7205 Biliary tract extraction >20 Fr 7207 Percutaneous cholecystostomy 7208 Trans-jugular liver biopsy 7301 Percutaneous antegrade pyelogram 7302 Percutaneous nephrostomy 7303 Percutaneous cystostomy 7304 Ureteric stenting 7306 Percutaneous nephrolithotomy 7310 Recanalisation of Fallopian tubes 7402 GI tract dilatation 7403 GI tract stenting 7404 GI tract diversion 7406 Gastrostomy 7501 Tracheal and bronchial stent 7502 (Except 7502.VM) Ablation of tumours etc. 7502.VM Percutaneous ablation of vascular malformation (direct puncture) 7503 Facet joint injection (1 set per joint) 7509 Extraction of stone or foreign body, non specified 7510 Percutaneous vertebroplasty / cementoplasty/ kyphoplasty 7511 Percutaneous bone biopsy exclusive from 7103-7107 7512 Radiofrequency ablation of tumor (include microwave ablation, cryoablation, IRE)
Others	Record any special procedures not included

3.5.5 Trainees should have performed at least 6 hands-on emergency procedures in the presence of a trainer during on-call sessions (i.e. after normal working hours) to gain experience in patient management under this setting. Specifically, on-call attendance should be recorded as appendix in training logbook with details of cases performed.

3.5.6 Trainees are encouraged to attend hands-on workshop organised by local and international interventional radiology societies and institutions during the 2-year higher training period, which will provide a more comprehensive learning of IR skill.

3.5.7 Trainees are required to submit 6 written case commentaries (one per month) that illustrates his/her ability in decision making in preprocedural workup, consideration of indications/contraindications of an IR procedure, post procedural care and/or management of complications. The 6 cases should cover as broad a spectrum of clinical setting/body organ system as possible.

3.5.8 If it is not possible to accommodate the volume of training content within the designated 6 months training period, the training department could arrange the remaining component during the period of general radiology training in a flexible manner.

3.6 CLINICAL RADIOLOGICAL CONFERENCES AND OTHER MEETINGS

Chaired and/or present in at least 12 CRC on IR cases.

3.7 PRESENTATIONS AND PUBLICATIONS

Please refer to the Guidelines on Higher Specialist Training (Radiology).

3.8 OTHER REQUIREMENTS

3.8.1 For documentation of training, the attached forms should be completed and attached to the training logbook for assessment.

Last version endorsed by HKAM Council Meeting on 20 October 2016 and effective from 1 July 2017
Revised version endorsed by HKAM Council Meeting on 18 November 2021 and effective from 1 July 2022

APPENDIX I

Record for Post IR Case Follow Up

HN number:
IR procedure and RIS codes:
Clinical indication:
Clinical result:
Complications and how to deal with (both intra-procedural & on follow up)
Possible follow up imaging and subsequent IR procedures.

Appendix II

Training Assessment Form

	Adequate	Inadequate
IR Technical Competency		
IR Knowledge (including IR principles, IR procedures, indications and contraindications, cost and cost-effectiveness of IR procedures)		
Safety (Prevention and Management for complications)		
Patient Communication (e.g. informed consent)		
Patient Care (Preparation, intra-procedural patient monitoring and post-procedural care)		
Procedural Record and Report		
Use of Drugs in IR including sedation, resuscitation		

Additional Comment from Trainer:

VASCULAR AND INTERVENTIONAL RADIOLOGY

TRAINING REPORT FORM AT 3 MONTHS

Name of trainee:
Name of trainer:
Name of co-trainer:
Trainer: trainee ratio:
Period of training with dates:

	Expected	Actual (Non vascular)	Actual (Vascular)
Duration of training	3 months		
Sessions of IR per week	5 or more		
No. of Basic examinations performed.	75		
No. of Basic examinations performed under direct supervision.	50		
No. of Advanced examinations observed.	any		
No. of Advanced examinations assisted or performed (all performed procedure should be under direct supervision).	40		

RIS examination codes for Basic examinations

Vascular: 6102, 6103, 6104, 6107, 6108, 6109, 6110, 6111, 6134, 6202, 6203, 6204, 6205, 6206, 6208, 6209, 6210, 6211, 6212

Nonvascular: 7103-7107, 7108-7109, 7206, 7209, 7299, 7308

VASCULAR AND INTERVENTIONAL RADIOLOGY

TRAINING REPORT FORM AT 6 MONTHS

Name of trainee:
Name of trainer:
Name of co-trainer:
Trainer: trainee ratio:
Period of training with dates:

	Expected	Actual (Non vascular)	Actual (Vascular)
Duration of training	6 months		
Sessions of IR per week	5 or more		
No. of basic examinations performed.	150		
No. of Basic examinations performed under direct supervision.	50		
No. of Advanced examinations observed.	any		
No. of Advanced examinations assisted or performed (all performed procedure should be under direct supervision).	80		

RIS examination codes for Advanced examinations

Vascular: 2401, 6105, 6106, 6113, 6114, 6117, 6301, 6301.AV, 6302, 6303, 6304, 6305, 6306, 6307, 6308, 6309, 6310, 6311, 6312, 6313, 6316, 6325

Nonvascular: 7201, 7202, 7203, 7204, 7205, 7207, 7208, 7301, 7302, 7303, 7304, 7306, 7310, 7402, 7403, 7404, 7406, 7501, 7502(except 7502.VM), 7502.VM, 7503, 7509, 7510, 7511, 7512