

HONG KONG COLLEGE OF RADIOLOGISTS

Higher Training (Radiology)

Subspecialty Training in Computed Tomography

[The following guidelines should be read in conjunction with the **General Guidelines on Higher Training (Radiology)**]

1. Introduction

- 1.1 Computed tomography (CT) is a major modality of diagnostic imaging applicable in emergency as well elective investigation or therapy of clinical problems. The introduction of helical scanning and multidetector techniques in recent years has opened up new fields of application of the technology.
- 1.2 While a trainee has been exposed to the use of CT during Basic Training, in the Higher Training period the following should be stressed:
 - (a) Practical experience
 - (b) In-depth knowledge and skill
 - (c) Increased responsibility
 - (d) Independent thinking and performance
 - (e) Appreciation and application of advanced CT technology
 - (f) Familiarity with various imaging guidelines and protocols
- 1.3 Computed tomography is classified by the College as a technique-based subspecialty (Category B).

2. Objectives

- 2.1 To understand the principle and console skills of helical/spiral and multidetector CT and the more specialized applications of CT in various parts of the body.
- 2.2 To have knowledge of related radiation risk and protection, and to minimize or optimize the radiation dose in CT scanning.
- 2.3 To prescribe, perform and interpret CT studies using state-of-art equipment and techniques, including optimal utilization of IV contrast medium.
- 2.4 To evaluate the application of CT with respect to other imaging modalities.
- 2.5 To learn the techniques (including management of complications) of CT-guided interventional procedures with or without CT fluoroscopic assistance.
- 2.6 To learn the workstation operation to expedite various means of data processing for image presentation, e.g. MIP, volume rendering, virtual endoscopy.
- 2.7 To develop communication and teaching skills.
- 2.8 To have skill, opportunity and guidance for research.
- 2.9 To learn how to critically appraise the current CT literature.

- 2.10 To have appropriate professional attitude and motivation towards continuous professional development.

3. Training Requirements

3.1 TRAINING CENTRE REQUIREMENTS

The trainee should have access to a modern CT scanner. The scanner should be able to perform:

- (a) Helical/spiral scans preferably with multidetector technique.
- (b) HRCT.
- (c) CT angiography.
- (d) CT guided interventional procedures.
- (e) 2D/3D image reconstruction (optional or performed separately on workstation).
- (f) Virtual endoscopy, e.g. bronchoscopy, colonoscopy (optional).
- (g) CT perfusion (optional).
- (h) CT cardiac (optional).
- (i) CT fluoroscopy (optional).

3.2 TRAINER REQUIREMENTS

- 3.2.1 At least one Subspecialty Trainer to be in-charge of the training program. One other co-trainer should also be named.

3.2.2 The Subspecialty Trainer should

- (a) have at least two years of continuous experience in CT following award of FRCR/FHKCR.
- (b) be currently practising CT actively.
- (c) preferably have overseas training in CT, lectures, publications and other teaching experience related to the subspecialty.

3.3 DURATION OF TRAINING

Training in the CT subspecialty can be taken in six months (extensive training) or in three months (short training).

3.4 DUTY SESSIONS

- 3.4.1 Irrespective of the training duration, the training program should appropriately comprise five or more CT sessions per week. The trainee's duties should include actual scanning of the patient, interpretation of imaging findings and preparation of reports.

- 3.4.2 Participation in CT management of trauma and emergency patients.

3.5 MINIMUM NUMBER OF EXAMINATIONS REQUIRED

- 3.5.1 Practical experience in performing and reporting CT examinations in the following anatomical sites.

- (a) **Brain.**
- (b) **Head and neck** including petrous temporal bones, pituitary, base of the skull, dural sinuses, orbits, sinuses, salivary glands, nasopharynx, oropharynx, larynx, trachea, the thyroid and parathyroid glands and lymph nodes.
- (c) **Chest** including the mediastinum, airways, pulmonary nodules, thoracic vascular assessment, tumour staging, pleura, diaphragm, chest wall and HRCT.
- (d) **Abdomen and pelvis** including general abdominal examination, multiphase liver, multiphase pancreas, multiphase kidney and staging of GI tract and pelvic tumours, the retroperitoneum, abdominal vascular assessment (especially aorta and renal arteries).
- (e) **Musculoskeletal system** including complex fractures (e.g. facial skeleton, spine, shoulder girdle, pelvic girdle), dislocations, soft tissue and bone tumours, articular pathology, quantitative CT bone densitometry.
- (f) **Trauma & emergency CT** of the above anatomical sites, particularly dissecting and leaking aortic aneurysm, pulmonary embolism, chest and abdominal trauma, spinal trauma (particularly cervical spine), acute abdomen (including suspected ureterolithiasis).
- (g) Appropriate use of **CT angiography** in the above situations (a-f) is emphasized, e.g. CT aortogram, CT pulmonary angiogram, CT angiogram of the Circle of Willis, CTA of transplants, CT cervical carotid arteries, CT renal arteries, CT lower limb arteries.
- (h) **CT guided interventional procedures**, e.g. biopsy and drainage.

3.5.2 Minimal number of cases for a six-month training:

Examination	RIS Coding*	Requirement
Brain	4101, 4102	200
Head & Neck	4103 – 4108, 4111-4118	25
Chest	4201, 4202, 4210, 4414	450
Abdomen	4203, 4204, 4221, 4222	
Pelvis	4205, 4206	
Musculoskeletal	4301- 4316	15
CT-guided IR procedures	7103, 7108, 7111	10

* CT-angiogram (4404) is counted in respect of the region studied.

3.5.3 For a three-month period rotation, 50% of the above number is acceptable.

3.5.4 Code of examinations (as per RIS given at appendix)

3.6 CLINICAL RADIOLOGICAL CONFERENCES AND OTHER MEETINGS

For six-month training, the trainee is expected to chair or present CT case materials in at least six clinico-radiological meetings.

3.7 PRESENTATIONS AND PUBLICATIONS

Please refer to the General Guidelines in Higher Training.

3.8 OTHER REQUIREMENTS

3.8.1 ***Optional examinations***

These are not essential for training and exposure is optional. Experience in the following is encouraged if time and equipment permit:

- (a) Virtual endoscopy.
- (b) CT perfusion.
- (c) CT cardiac.
- (d) CT fluoroscopy.

3.8.2 The program should also encompass other academic activities, including audit and quality assurance activities, management of and contribution to film museum and teaching files in respect of CT cases.

<u>RIS CODING</u>	<u>REGION DESCRIPTION</u>
4101	Brain plain
4102	Brain+con.
4103	Temporal plain
4104	Temporal+con.
4105	Orbit plain
4106	Orbit+con.
4107	Pituitary plain
4108	Pituitary+con.
4109	Dental plain
4110	Dental+con.
4111	Nasopharynx plain
4112	Nasopharynx+con.
4113	Sinuses plain
4114	Sinuses+con.
4115	Neck plain
4116	Neck+con.
4117	Face plain
4118	Face+con.
4201	Thorax plain
4202	Thorax+con.
4203	Abdomen plain
4204	Abdomen+con.
4205	Pelvis plain
4206	Pelvis+con.
4210	HRCT
4221	Colonoscopy plain
4222	Colonoscopy +con
4301	Upper extremities plain
4302	Upper extremities +con.
4303	Lower extremities Plain
4304	Lower extremities +con.
4305	Cervical spine plain
4306	Cervical spine+con.
4307	Thoracic spine plain
4308	Thoracic spine+con.
4309	Lumbar spine plain
4310	Lumbar spine+con.
4311	Lumbosacral spine plain
4312	Lumbosacral spine+con.
4313	Sacrum plain
4314	Sacrum+con.
4315	Sc Joint plain
4316	Sc Joint+con
4401	Infant plain
4403	3D-CT
4404	CT-angiogram
4407	Pelvimetry
4408	QCT
4414	CT Virtual Endoscopy-others
7103	CT guided FNAB (w or w/o pathologist)

7108 CT guided drainage (1 set per catheter or each non-communicating
collecting aspirated) exclusive with 7109

7111 Pre-CT guided procedure diagnostic set