

CARDIOTHORACIC SURGERY RESIDENCY

TRAINING REQUIREMENTS

(A) INTRODUCTION

Definition of specialty

Cardiovascular Surgery is that branch of surgery concerned with congenital and acquired diseases of the pericardium, heart and great vessels and their branches. Thoracic Surgery is concerned with congenital and acquired diseases of the chest wall, mediastinum, lungs, trachea, pleura, esophagus and diaphragm.

Scope of specialty

Cardiothoracic Surgery specialists are trained in the diagnosis and management of patients with cardiovascular and thoracic diseases, including the provision of surgical intervention when indicated and post operative care. The appropriate roles of the cardiothoracic surgeon include being a medical expert, clinical decision maker, communicator, collaborator, manager, health advocate, scholar and research scientist.

Duration of training in specialty

The Cardiothoracic Surgery residency program is a 6 years program detailed in the following sections.

(B) PROGRAMME OVERVIEW

Brief description of training program

The 6 years residency program consists of the following:

A. 2-year SIG Program

B. Core Program

- a) Fulfil the minimum number of cases/procedures in Cardiac, Thoracic and Vascular clinical and/or operative experience listed in section D

C. Other training requirements

- a) Cardiac Catheterization
b) Echocardiography
c) Vascular Surgery
d) Bronchoscopy
e) Electrophysiology
f) Other modalities of assessment

In general, 1 trainee position is allotted to a unit per 400 open heart surgery procedures per year.

Core experiences to be fulfilled

Trainee is to fulfil clinical and/or operative core experiences in the following:

- Coronary/ Congenital (Open heart and close heart)/ Valvular
- Bronchoscopy/ Major (Lobectomy, pneumonectomy, mediastinal)/ Minor (pleurodesis, video assisted thoracoscopic surgery)

Outcome of the training program

At the end of the 6 years residency program, the candidate must pass an annual Joint Specialty Fellowship exit exam in Cardiothoracic Surgery consisting of a clinical exam and Viva (Oral) exam. The training targets to ensure that the trainee would become a safe and proficient Cardiothoracic Surgeon after completion of the programme.

(C) ADMISSION REQUIREMENTS

Residents are required to fulfil the following postings during their 2-year SIG training:

Residency Year	Postings	Duration
1 (R1)	General Surgery	12 months
2 (R2)	Cardiothoracic Surgery	3 months
	Cardiology	6 weeks
	Respiratory Medicine	6 weeks
	Anaesthesia [Including at least 1 month Surgical Intensive Care Unit (SICU)]	3 months
	Emergency Medicine	3 months

Entry into the advanced specialty (Cardiothoracic Surgery) residency programme requires successful completion of the Surgery-in-General (SIG) Residency program, and passing of the MRCS examination.

(D) TRAINING REQUIREMENTS

Sub-Specialty	Procedure	No	No	No
		Performe	Assisted	Observed
		Level 1	Level 2	-
Adult Cardiac (general)	1. Sternotomy	30		
	2. Sternal Closure	30		
	3. Cannulation	20		
	4. Decannulation	20		
Coronary Artery Bypass Grafting	1. Open Vein Harvest	20		
	2. Endoscopic Vein Harvest	20		
	3. Radial Artery Harvest	5		
	4. Internal Mammary Artery Harvest	20		
	5. Proximal Aorto-Coronary Anastomosis	30		
	6. Distal Aorto-Coronary Anastomosis	15		
	7. Full CABG	5		
Valvular Heart Disease	1. Mitral Valve Repair/Replacement		20	
	2. Aortic Valve Repair/Replacement		20	

Sub-Specialty	Procedure	No Performed	No Assisted	No Observed
Arrhythmia Surgery	MAZE Procedure			5
Aortic/VascularSurgery	Repair of Type A Aortic Dissection			5
	Femoral Artery Cutdown and Repair	5	5	
Mechanical Assist	Intra-Aortic Balloon Pump Insertion	10		
	Extra Corporeal Membrane Oxygenation -	5	5	
	Ventricular Assist Device			5
Thoracic Surgery	Thoracotomy	10		
	Open Pulmonary Resection		5	5
	Video Assisted Pleurodesis	10		
	Video Assisted Lobectomy		5	5
	Pericardial Window		10	
Congenital Cardiac	PDA Ligation		5	
	Atrial Septal Defect Repair		10	
	Ventricular Septal Defect Repair			5

1) Core rotation and minimum duration

Core Rotation	Minimum duration (Months)
Paediatric Congenital Surgery	6
Out of parent department	6

2) Other training requirements

Trainee is encouraged to spend at least 3 months, and accrue experience in one of the following postings during the period of training: (“Cardiac laboratory” does not have vascular surgery, bronchoscopy)

- a) Cardiac Catheterization
- b) Echocardiography
- c) Vascular Surgery
- d) Bronchoscopy
- e) Electrophysiology
- f) Other modalities of assessment

3) Criteria for progression to senior resident

The criteria for progression to Senior Resident are as follows:

- a. Certification by Programme Directors (PD) that the resident has completed R3 and acquired the necessary competence specified for a R3 resident.
- b. Fulfilment of the requirements laid down by the Residency Advisory Committee (RAC) for progression to Senior Resident as follows:

LENGTH OF RESIDENCY YEARS	MINIMUM YEARS OF RESIDENCY TRAINING IN CTS	CRITERIA FOR PROGRESSION TO SENIOR RESIDENT
TY+R1-R6	4 (R3-R6)	<ul style="list-style-type: none"> • Pass MRCS • Successful Completion of Surgery-In-General programme • Satisfactory Progress Reports • PD certification of successful completion of R3

4) Key Competencies

The training program aims to achieve the desired outcomes in the 7 key competencies of patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, system-based practice and faculty development.

I. **Patient Care**

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents are expected to:

- a) Gather and understand essential patient information in a timely manner;
- b) Generate an appropriate differential diagnosis;
- c) Implement an effective plan of management;
- d) Prioritize and stabilize multiple patients simultaneously;
- e) Competently perform cardiac, thoracic and vascular operative procedures;
- f) Manage complications;
- g) Analyze outcomes;
- h) Counsel and educate patients and families;
- i) Provide health care services aimed at preventing health problems and maintaining health;
- j) Work with health care professionals to provide patient-focused care;
- k) Must participate in the management (including critical care) and surgical care of adult and paediatric patients and experience should include the full spectrum of cardiothoracic disorders; and
- l) Must have opportunities to evaluate patients referred for elective surgery in an outpatient environment. Under appropriate supervision, this experience should include obtaining a complete history, conducting an examination, ordering (if necessary) and interpreting diagnostic studies, and arriving independently at a diagnosis and plan of management. Consonant with their skills and level of experience, residents should be actively involved in preoperative decision making and subsequent operative procedures under the supervision of the attending physician who has ultimate responsibility for the patient. Residents should similarly be actively involved in post-surgical care and follow-up evaluation of their patients to develop skills in assessing post-operative recovery, recognizing and treating

complications, communicating with referring physicians and developing physician-patient relationship.

II. Medical Knowledge

Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioural sciences, as well as the application of this knowledge to patient care. Residents are expected to:

- a) Generate a differential diagnosis and properly sequence critical actions for patient care, including of management of complications, morbidity and mortality;
- b) Synthesize and properly utilize acquired patient data;
- c) Identify cardiac, thoracic and vascular emergencies;
- d) Know how to access current medical information;
- e) Understand how to treat cardiothoracic surgical conditions;
- f) Incorporate evidence-based principles;
- g) Must have experience and instruction in the relevant basic sciences

III. Practice-based Learning and Improvement

Residents must demonstrate the ability to investigate and evaluate their care to patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:

- a) Identify strengths, deficiencies, and limits in one's knowledge and expertise;
- b) Set learning and improvement goals;
- c) Identify and perform appropriate learning activities;
- d) Systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;
- e) Incorporate formative evaluation feedback into daily practice;
- f) Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;
- g) Use informative technology to optimize learning;
- h) Participate in the education of patients, families, students, residents and other health professionals;
- i) Apply knowledge of study design and statistical methods to critically appraise the medical literature;
- j) Facilitate the learning of students and other health care professionals;
- k) Resident participation in undergraduate medical education is desirable.

IV. Interpersonal and Communication Skills

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to:

- a) Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;
- b) Communicate effectively with physicians, other health professionals, and health related agencies;
- c) Work effectively as a member or leader of a health care team or other professional group;

- d) Act in a consultative role to other physicians and health professionals;
- e) Maintain comprehensive, timely, and legible medical records;
- f) Develop an effective therapeutic relationship with patients and their families, with respect for diversity and cultural, ethnic, spiritual, emotional, and age-specific differences;
- g) Develop effective written communication skills;
- h) Involve patients in medical decisions; and,
- i) Strengthen listening and non-verbal communication skills.

V. Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

- a) Compassionate, integrity, and respect for others;
- b) Responsiveness to patient needs that supersedes self-interest;
- c) Respect for patient privacy and autonomy;
- d) Accountability to patients, society and the profession;
- e) Sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;
- f) Treat patients/ family/ staff/ paraprofessional personnel with respect;
- g) Demonstrate sensitivity to patient's pain, emotional state, and gender/ethnicity issues;
- h) Discuss death honestly, sensitively, patiently, and compassionately;

VI. Systems-based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

- a) Work effectively in various health care delivery settings and systems relevant to their clinical specialty;
- b) Coordinate patient care within the health care system relevant to their clinical specialty;
- c) Incorporate considerations of cost-awareness and risk-benefit analysis in patient and/or population based care as appropriate;
- d) Advocate for quality patient care and optimal patient care systems;
- e) Work in inter-professional teams to enhance patient safety and improve patient care quality;
- f) Participate in identifying system errors and implementing potential systems solutions;
- g) Understand, access, appropriately utilize, and evaluate the effectiveness of the resources, providers, and systems necessary to provide optimal cardiac, thoracic and vascular care;
- h) Understand different medical practice models and delivery systems and how to best utilize them to care for the individual patient;
- i) Practice cost-effective health care and resource allocation that does not compromise quality of care;
- j) Advocate, coordinate, and facilitate patient care; and,
- k) Understand principles of and advance practices for patient safety at the institutional and individual level.

VII. Faculty development (residents as future educators)

Residents must demonstrate ability to, and participate in the education, supervision, and evaluation of their juniors, medical students, and other healthcare professionals. Residents are expected to:

- a) Demonstrate leadership and team management skills applicable to their clinical practice;
- b) Effectively provide feedback and evaluations to other clinical staff, junior staff, and medical students;
- c) Be able to set teaching goals and expectations, and are able to prepare an effective presentation;
- d) Participate in group teaching, lectures, and presentations at professional meetings

5) Resident's Scholarly Activities

- a) The curriculum must advance residents' knowledge of the basic principles of research including how research is conducted, evaluated, explained to patients, and applied to patient care
- b) Residents should participate in scholarly activity:
Graduate medical education must take place in an environment of inquiry and scholarship in which residents participate in the development of new knowledge, learn to evaluate research findings, and develop habits of inquiry as a continuing professional responsibility
- c) The sponsoring institution and program should allocate adequate educational resources to facilitate resident involvement in scholarly activities

(E) SUPERVISION AND WORK HOURS OF RESIDENTS

I. Supervision

All residents will be supervised by a designated supervisor. The ratio of all teaching faculty to residents should be 1:1. The number of core clinical faculty to resident ratio must be no less than 1:6 for surgical subspecialties and no less than 1:2 for internal medicine-related subspecialties. 20% of resident's time must be protected for training.

II. Work Hours

Work hours can be defined as all clinical and academic activities related to residency training. Work hours must be limited to 80 hours per week, averaged over a month, including all on-calls. Residents must be allowed 1 day (i.e. 24 continuous hours) in 7 days free from all clinical administrative and academic responsibilities, averaged over a month. Adequate time for rest and personal activities must be provided. This should consist of a 10-hour time period provided between all daily duty periods and after in-house call.

In-house call must occur no more frequently than every third night, averaged over a four-week period. No new patients may be seen after 24 hours of continuous duty. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may continue to be on duty for up to six additional hours to participate in didactic activities, transfer care of patients, conduct outpatient clinics, and maintain continuity of medical and surgical care.

Work hours must be reported in the designation system (e.g. New Innovations) and tracked by the Programme Director.

(F) ASSESSMENT AND FEEDBACK

I. Log of operative / clinical experience

All residents should strictly maintain a designated logbook, carefully documenting the exact parts of the operation that was performed personally in each operation.

II. Assessment

The supervisor's evaluation of the resident should be performed at the end of every rotation (6-monthly) using the designated assessment report form and then submitted to the JCST Secretariat by PDs, detailing satisfactory completion of each component listed in the training syllabus, and be reviewed and certified by the RAC on an annual basis. Residents without a satisfactory log or assessment will not be allowed to progress to the next year of training and will be required to repeat the posting. Two consecutive non-attendance of the scheduled 6-monthly MTTs without satisfactory justification will be deemed as an unsatisfactory assessment.

III. Feedback

Residents should perform a yearly evaluation of teaching faculty and the training programme using the designated forms. These forms must be submitted to the RAC and kept absolutely confidential. *(KIV to engage IT systems for the provision of the survey)*

IV. Examinations

- 1) Residents are required to pass the MRCS at the end of the SIG Residency (R2) to progress to R3.
- 2) Conjoint Exit Examination with Royal College of Surgeons of Edinburgh (RCSEd) and College of Surgeons, Hong Kong (Tripartite) as the final exit certification

(G) CHANGES IN TRAINEESHIP PERIOD AND LEAVE OF ABSENCE

I. Changes in Training Period

Residency should be continuous. If a training programme is interrupted for any reason whatsoever, the RAC may at its discretion, require the residents to undergo a further period of training in addition to the minimum requirements of the programme or terminate the residency altogether. All residents are required to conform to the residency training plan as approved by the RAC and complete all the exit and training requirements within the maximum candidature.

II. Leave Of Absence

All residents are to comply with the prevailing MOH policy on Leave of Absence.

III. Overseas Postings

Overseas attachment during Senior Residency training is not permitted with the exception of Radiation Oncology and Neurosurgery (*refer to JCST Circular 114/14*).