Egyptian Fellowship Board

Congenital Heart Surgery Curriculum

CONTENTS

PREFACE

- The Egyptian Fellowship Board and the Egyptian Fellowship of Congenital Heart surgery (EFOCHS) scientific council worked collaboratively and closely to make this curriculum available for trainees' guidance and support.
- Worldwide, postgraduate medical education is now governed by sets of academic standards that describe the qualities and abilities of graduates. In addition, there are standards for the training processes, trainers' selection and methods of assessment to ensure transparency and clarify expectations.
- The Egyptian fellowship board has already defined and published its standards for the general and professional competencies' expected from our graduates in different specialties upon successful completion of training. These expectations are clearly reflected in the CHS curriculum.
- The curriculum describes what trainees should know and be able to do upon completion of training. The curriculum also describes in details, expectations from trainees at the end of the training program.
- Methods of assessment and examination regulations are also available in the last section of the curriculum.
- All topics covered during clinical and theoretical studies are outlined. This will help trainees to guide their readings and their choice of learning activities. In addition, all required procedures are listed together with the expected performance.
- Mandatory courses are also mentioned and the Egyptian Fellowship Board will work closely with EFOCHS scientific council to ensure proper organization of courses at appropriate training stages.
- We hope that all our trainees, trainers and educational supervisors will follow the guidelines provided in the curriculum and cooperate with The Egyptian Fellowship Board and EFOCHS Scientific Council to implement the curriculum in the best ways.
- This curriculum will be revised and updated every 3 years.

Secretary General
Higher Committee of Medical Specialties
January, 2017

REFERENCES

The Committee consulted international curricula in Congenital heart surgery. The external references for the development of this curriculum are:

- Congenital heart disease by Richard Jonnas
- American board of thoracic surgery “ABTS”
- European board of thoracic and cardiovascular surgery “EBTCS”

Acknowledgement

This curriculum has been created through collaboration between the head of EF-CHS Scientific Council, the EF-CHS accreditation team and the Egyptian Fellowship Curriculum Committee. The following members of the Congenital heart surgery experts have made substantial contribution to the curriculum development as subject matter experts

- P*rofessor Dr **Magdy Gomaa**, Professor of Congenital heart Surgery, Cairo University and head of the Congenital heart Surgery scientific council*
- *Dr **Sameh Elameen**, Consultant of Cardiac Surgery, Head of Department, National Heart Institute (NHI) of Egypt and training program director of EFOCHS.*
- *Dr **Sayed Salem**, Assistant Professor of Congenital Cardiac Surgery, National Heart Institute (NHI) of Egypt*
- *Dr **Ahmed Mostafa Omran,** Fellow of Cardiac Surgery, NHI of Egypt*

The Egyptian Fellowship Curriculum Committee has made significant contribution to the curriculum through Collaboration with the council in the design and formulation of the educational structure. The member who participated in this work is *Prof Dr **Shereen Fawzy Hafez**, Professor of Medical Microbiology & Immunology, Ain Shams University, Medical education expert and technical coordinator of the Egyptian Fellowship for international accreditation of Congenital heart Surgery specialty.*

Goal

The goal of EFOCHS curriculum is to graduate a safe competent trained specialist in Congenital Heart surgery (CHS) who will be able to work within Health Services and will have the **knowledge, skills and attitudes** required to do this and to develop further subspecialty expertise if appropriate.

Aims

The educational process in the fellowship of CHS aims to equip trainees with the necessary knowledge, skills and attitude so that they will acquire competencies; at a level consistent with practice in the specialty of CHS and at the level of professionalism, that will include the following:

- Patient care that is appropriate, effective and compassionate while dealing with health problems and health promotion.
- Medical knowledge in the basic/clinical sciences and medical ethics with application of such knowledge in the diagnosis and management of patients with congenital heart disorders.
- Acting as safe independent specialists whilst recognizing the limitation of their ability and the obligation to seek assistance from colleagues when appropriate.
- Interpersonal and communication skills that ensure effective information exchange with individual patients/their families and work in a team with other health professionals.
- Appraisal and utilization of new scientific knowledge to update and continuously improve clinical practice.
- The ability to function as a trainer and teacher in relation to colleagues and healthcare workers.
- Maintenance of standards appropriate in their professional field and able to respond constructively to assessments and appraisals.

Entry requirements for the Egyptian Fellowship of CHS

Any of the following is considered a satisfactory entry requirement for the Egyptian Fellowship of Congenital heart Surgery

1. Fellowship of Egyptian Board of Cardiothoracic Surgery
2. MD in Cardiothoracic Surgery

MANDATORY COURSES

Each trainee has to attend an internationally recognized Life support training course (BLS and ALS) and provide a valid certificate as prerequisite for entry ST1

TRAINING RULES & REGULTIONS

STRUCTURE OF THE TRAINING PROGRAM

The structure of the training program of EFOCHS Board requires Two- years supervised training that must be conducted in an accredited hospital before sitting for the final examination.
A list of accredited hospitals will be announced yearly by the Board.
During the entire training program the candidate must be dedicated full time and must be fully responsible for patient care. Holidays and on call duties are according to Ministry of health regulation.

GENERAL RULES For Evaluation OF TRAINEE PERFORMANCE

I-Workplace Based Assessment (WPBA)

Performance of the trainee is evaluated on regular and continuous basis. The evaluation process should involve all aspects of the training including clinical and procedural/surgical skills, review of the logbook as well as review of attendance and participation and the research study.
This is performed on monthly basis and through the annual assessment review process (ARP) for the trainees.
Workplace based assessment will be performed for procedural skills by using procedure based assessment (PBA). It is mandatory that each trainee achieve a satisfactory level in the selected 10 procedures to sit for the Final part examination.

THE LOGBOOK

- It is the responsibility of the trainee to record activities into the logbook at least on weekly basis.
- These entries should be signed by the trainer directly supervising the trainee during the procedure and countersigned by his assigned trainer.
- Educational activities should also be recorded and signed by person in charge of the activity and countersigned by the assigned trainer.
- Logbooks should be ready for inspection by the education supervisor at all times.
- It is the responsibility of each trainee to fill the logbook statistics in the trainee assessment form (attached). This form should be counter signed by his assigned trainer.
- Logbooks and trainee assessment forms will form part of the evidence submitted for the annual assessment meeting by review committee.

Procedure Based Assessments (PBAs)

The PBA is a formative method (without marks allocated in the exit exam) for assessing a range of competencies involved in performing certain surgical procedures during routine training. It enables trainees to build on assessor feedback and follow their own progress. Although PBA is formative, the summary evidence will be used to inform the ARP and will contribute to the decision made as to how well the trainee is progressing and his eligibility to sit for exam. The tool has two principal components:

1- A series of competencies within four core domains (consent, preoperative planning, preoperative preparation, exposure and closure, operative technique and post-operative management) that are scored as follows:

N = Not observed **U** = Unsatisfactory **S** = Satisfactory

2- An overall global assessment divided into four levels rated as follows:
   - Level 0: Insufficient evidence observed to support a judgment
   - Level 1: Unable to perform the procedure under supervision
   - Level 2: Able to perform the procedure under supervision
   - Level 3: Able to perform the procedure with minimal supervision (occasional help)
   - Level 4: Competent to perform procedure unsupervised (and deal with complications). It is the ability to perform the procedure to a standard expected of a specialist in practice.

Who should do an assessment?

In general this is likely to be on most occasions the trainee's assigned trainer, but it is anticipated that in any one training period, particularly for certain procedures, other surgical consultants may be involved depending on the trainee's work pattern. The surgical assessor must be trained in the use of the PBA.

Trainees will also find that reflecting on the assessment criteria (as contained in the assessment form and validation worksheet) can help them define any gaps in their understanding or ability which they can bring to the discussion with their assigned trainer and other senior colleagues.

The number of assessments required:

During a period of training, trainees will be observed multiple times carrying out different domains of the procedure until reaching the satisfactory standard and their overall rating is 4. Trainees are encouraged to perform as many as possible.

How should it work?

The trainee's learning agreement should indicate which PBAs (or sections of PBAs) were selected. The procedures should be representative of those the trainee would normally carry out at that level and should be one of the indicative list detailed in the training book.

The process is trainee led. It is the trainee's responsibility to ensure the required number of PBAs is performed to a satisfactory standard by the specified timescale. The trainee will need to be familiar with the PBA form, internal validation table below and portfolio consolidation sheet. The trainee generally chooses the timing and makes the arrangement with the assessor.

Assessors do not need to have prior knowledge of the trainee. The assessor should observe the trainee undertaking the agreed sections of the PBA in the normal course of workplace activity (usually scrubbed). Given the priority of patient care, the assessor should choose the appropriate level of supervision depending on the trainee's stage of training. Trainees should carry out the procedure, explaining what they intend to do throughout. If the trainee is in danger of harming the patient at any point s/he must be warned or stopped by the trainer immediately.

WHAT DOES A COMPLETED PBA MEAN?

A completed set of PBAs provides evidence that a trainee has learned to perform competently a number of procedures in supervised settings.

Feedback

When a PBA is completed, the assessor should provide immediate feedback to the trainee in a debriefing session. The assessor should identify areas of achievement and opportunities for development. This should be done constructively and in a suitable environment. The PBA will take as long as the procedure itself but the completion of the form should take about 20 minutes including feedback to the trainee.

After the assessment and feedback

The original form should be signed by both the assessor (assigned trainer or other consultant) and the trainee. The PBA then forms a completed record of a particular incident. The assessors' responsibility ends at this point although it is possible an assessor may be asked to verify a rating at a later point if a query arises.

Tips for Using Procedure-Based Assessments (PBAs)

• Perform an assessment every time an index procedure is carried out (or at least once per list), rather than the bare minimum. This helps to make assessment and feedback 'routine' and aids learning.

• Focusing on one particular phase of a procedure can reduce stress on the Assessor and the Trainee.

• Day-case lists are ideal for assessing consent and pre-operative planning

• Review of the PBA form before the start of the procedure can help with the theatre team briefing.

• Keep a stock of PBA forms for commonly performed index procedures in theatre.

• The Trainee can write up the procedure note whilst the Assessor completes the assessment form (not forgetting to assess the procedure note as well).

• The theatre coffee room can be an ideal place for the Assessor and Trainee to review the completed PBA form, and for the Assessor to provide constructive feedback.

• Completion of the form without providing feedback is much less useful for the trainee as it becomes a 'tick box' exercise.

• Items rated as 'Development Required' should be expected the first time that a Trainee performs a procedure. This simply means that they need more practice and more assessments.

PROCEDURES SELECTED FOR ASSESSMENT (INDEX PROCEDURES)

	Procedures selected for assessment
1	VSD Closure
2	BT shunt
3	AV valve repair
4	Coarctation repair
5	Senning or Mustard Procedure
6	Cavopulmonary Shunt
7	Total repair of Fallout
8	RV-PA conduit
9	Arterial switch
10	Fontan procedure

Research Project

The trainee will do a prospective/retrospective research during the training program under the guidance and supervision of his/her trainer. Such research should be appropriately written (not necessarily published) and accepted by the ARP committee for the trainee to sit for the second part examination.

ANNUAL REVIEW PROCESS (ARP)

- The chairman of the scientific council sets the date for the ARP, selects the members of the review board and sends the invitations.
- Minimum 4 out of the following review board members (Chairman of scientific council + program director + council member + educational supervisor + specialty coordinator + representative of trainers) should attend this meeting.
- Trainees will be notified one month ahead of the meeting date.
- Learning agreements, logbooks (including PBAs), trainer monthly reports, educational supervisor reports, trainee assessment forms and training post assessment forms should be submitted by the specialty coordinator at least 3 weeks before the date of the meeting (all these forms are attached)
- The specialty coordinator will forward the above documents to the review board members at least 2 weeks before meeting date.
- The following items will be assessed in the meeting:
    - ✓ Verification of signatures
    - ✓ Attendance of activities
    - ✓ Trainees' performance during previous placement
    - ✓ The level of competence achieved by the trainee

- Based on the above evidence and following discussion with trainees one of the following outcomes will be decided:
    - ✓ **ARP 1**: Satisfactory to progress to the following stage
    - ✓ **ARP 2**: Can proceed but with targeted training (closer than usual monitoring and supervision, to address particular needs & provide feedback). The recommended improvements will be reassessed in the following ARP meeting.
    - ✓ **ARP 3**: An official warning of discontinuation of the training program will be issued if the previous recommendations have not been rectified, subject to review in a follow up meeting.
    - ✓ **ARP 4**: Unsatisfactory and should be dismissed from the training program.
    - ✓ **ARP 5**: Satisfactory completion for training program, legible to sit for a final exam.

LEARNING AGREEMENT

- Soon after start of each post the trainee and trainer should arrange a formal meeting to discuss trainee needs and career plans.
- An agreed plan should be documented in the learning agreement form detailing objectives, procedures and other activities to be achieved during the placement.
- This form should be filled no later than one month after the start of the post and the form should be forward to the EFOC offices to be retained in the candidates file.
- Dates of future meetings to review the progress of the trainee and the training process should be agreed on during the initial meeting and documented on the form.
- In each of the above meetings the trainee and the trainer should discuss the achieved objectives and plan further actions.
- At the end of the post the completed learning agreement should be forward to the Egyptian board offices together with trainee and training post assessment forms to document the progress of such objectives in respective post. These forms together with other evidence will form the basis of the Annual Review Process (ARP) meeting.

TRAINEE WEEKLY ACTIVITIES

It is expected that the trainees are attached to their respective hospitals for 6 days per week and are freed from any hospital duties 2 days per month to participate in the Central Teaching Days +/- other educational activities.

The weekly timetable of clinical and scientific activities held in the training hospitals should be drafted at the beginning of each placement and documented in the Learning Agreement Form. This form is sent to the Egyptian Fellowship Boards and copies are kept by both the trainer/s and trainee/s. This form is made available to the Educational Supervisor/s, and shall form the basis of their visits to the hospitals.

It is the duty of the trainers to ensure that trainees are freed from hospital duties at least for an additional half day per week which is dedicated for formal teaching in their respective hospitals.

Activities held in the training hospital shall cover the following:

- **6 days per week (12 sessions) in the training hospital:**

1 session outpatient clinic
1 session group ward round

6 sessions operating theatre
1 session ICU (day), 1 session ICU (night)
2 sessions educational activities:

a) Lectures

b) Morbidity- Mortality

c) Journal club

d) Meetings: Clinical meetings with cardiology department

e) Research activities: including the preparation of the allocated research report and data collection

f) Grand rounds

Central Scientific Day

All Trainees are expected to have protected teaching time at a specific day every 2 weeks. The teaching program of these days is drafted centrally at the Egyptian Fellowship Boards.
The Specialty Coordinator should notify training centers by the agenda of these days.

ROTATION PLAN OF TRAINEES

1- ST 1&2 general surgery training; in centers both accredited for general surgery and basic congenital heart surgery
2- ST3 basic cardiac and thoracic surgery training; in an accredited cardiac and thoracic surgery basic training center (6 months thoracic, 6 months basic cardiac-surgical skills)
3- ST4-6 advanced training in an advanced training center.

INTERRUPTION OF TRAINING

It is not permissible to interrupt such a structural training program except in major unavoidable circumstances. Such circumstances should be convincing and approved by the Secretary General of the higher committee of Medical Specialties and the program director. The interruption once approved should not be for more than one year. Interruption of the training program for more than one year shall result in dismissal from the program and cancellation of the preceding training period

Job description of the trainee during Congenital heart Surgery training Program

Job description for ST3 trainee

In Emergency room

1- The first on call; conduCHS primary assessment and management of surgical patients in ER
2- Suggests admission of patients and takes the opinion of his consultant

In wards & ICU

1- Clerking of all admissions (history, general and cardiac/thoracic clinical examination) and suggests basic investigations and plan of management
2- Perform daily rounds
3- Takes informed consent from patients
4- Write detailed daily progress notes
5- Arrange discharge, home medication and follow up appointments of inpatients
6- Assists in various bedside procedures and basic monitoring techniques; including intubation, arterial line insertion, CVC insertion, wound dressing, skin stitches, blood transfusion, phlebotomy, venisection, pericardiocentesis and ICT insertion.
7- Assess patients for reopening and call for senior staff
8- Administration of emergency drugs after consultation.
9- Follow and obtains various results of investigations and reports abnormal results to seniors
10- Follow up referral of patients to other specialties
11- Observes seniors explaining to patients the methods of management, prognosis of their illness and discusses this process with seniors
12- Checks completeness of medical reports of patients
13- Participates in pre and post operative assessment of the patient.

In OPD

1- Attends the surgical admission clinic with other senior staff
2- Attends the outpatient cardiac surgical clinic
3- Completes various hospital forms

In OR

1- Participates in basic operative planning
2- Participates in adult cardiac surgical procedures and performs some under supervision
3- Performs independently CPB.
4- Learns how to write operative notes and postoperative orders
5- Learns the usage of various operative instruments and implants

Educational activities

1- Presents cases in rounds
2- Participates in grand rounds and journal clubs
3- Attends all educational activities of the training program

4- Attends local education courses and basic courses
5- Learns to prepare audiovisual materials for presentations

Surgical Procedures that should be performed according to their competence level by the end of ST3

CODE	DESCRIPTION OF PROCEDURE	Level of Competence	Minimum accepted number
2.3. CARDIAC PROCEDURES			
TS.2.3.1	SURGICAL INCISIONS IN DIFFERENT AGE GROUPS		
TS.2.3.1.1	Median sternotomy	T3	10
TS. 2.3.2. EXTRACORPOREAL CIRCULATION			
TS. 2.3.2.1	Cannulation and bypass	T3	20
TS. 2.3.2.2	Weaning from bypass	T3	20
THEME 3. CORONARY ARTERY DISEASE (CAD)			
TS.3.2.1	Saphenous vein harvest	T3	10
THEME.7 CARDIAC NEOPLASMS AND PERICARDIAL DISEASES			
TS.7.3.1	Pericardial drainage	T2	10
THEME 10. THORACIC SURGERY			
TS.10.2.3.1.1	Thoracotomy	T3	10
TS.10.2.3.1.2	Minimally invasive incisions	T1	5
TS.10.2.3.2	Diagnostic & therapeutic rigid/fiberoptic brochoscopy (including airway FB removal)	T3	20
TS.10.3.1	Thoracotomy in an emergency setting	T4	2
TS.10.4.1	Lung resections	T2	30
TS.10.6.1	Intercostal tube insertion and care in different age groups	T5	30

TS.10.6.2	Bullectomy/blebectomy & pleurodesis for pneumothorax	T2	5
TS.10.6.3	Pleural effusion drainage	T3	20
TS.10.6.4	Decortication for empyema	T2	10
TS.10.7.1	Mediastinal mass biopsy	T1	5
TS.10.7.2	Drainage of mediastinal infections	T2	2
TS.10.7.3	Rewiring & dewiring of the sternum	T2	2
TS.10.7.4	Pectoral flap	T1	5
TS.10.7.5	Omental flap	T1	5

Standards for technical skills

For any given procedure the trainee should be able to explain its pre/intraoperative preparations, steps, indications, contraindications, advantages, disadvantages, complications and outcomes.

Each procedure has a competence level ascribed to it in the areas of technical skills ranging from 1 to 5.

B- Levels of Technical Skill (TS) Competence	
T1= Observe (Real/Video); Has adequate knowledge of the steps through direct observation.	T2= Can assist; ability to handle instruments relevant to the procedure appropriately and safely and perform some parts of the procedure with reasonable fluency.
T3= Can do under supervision; carries out a straightforward procedure fluently and demonstrates when to call for assistance/advice from the supervisor (knows personal limitations).	T4= Competent to do whole without assistance, including managing complications and adaptation to well-known variations in the procedure encountered
T5= Can teach and supervise his/her junior colleagues to do the procedure	

Job description for ST 4/5/6 trainee

In Emergency room

1- The first/second on call; conduCHS primary assessment and management of patients in ER
2- Decides on and admits patients with consultation of seniors
3- Performs various emergency procedures performed in ER
4- Manage CPR team

In wards and ICU

1- Performs or supervises clerking of all admissions, requests basic and special investigations and draws plan of management
2- Perform daily rounds
3- Takes informed consent from patients
4- Writes /comments on daily progress notes
5- Write discharge notes with supervision and checks proper home medication and doses and proper follow up appointments of inpatients
6- Performs independently various bedside procedures and basic monitoring techniques under supervision if necessary
7- Checks results of various investigations and report to the attending surgeon
8- Takes actions based on results of investigations after consulting with seniors when required
9- Suggests referral of patients to other specialties
10- Assists in explaining to patients the methods of management and prognosis of their illness and discusses this process with senior staff
11- Write preliminary medical reports of patients
12- Ensures full preoperative assessment and preparation under supervision of seniors
13- Performs post operative follow up of the patient.

In OPD

1- Assess patients in the cardiac admission clinic with supervision
2- Suggests booking patients for elective admission under supervision and completes admission forms.

In OR

1- Prepare operative lists and actively participates in operative planning of various operations
2- Participates in all surgical procedures as first assistant
3- Performs the required procedures according to required level of competence
4- Writes operative notes and postoperative orders
5- Master the usage of various operative instruments and implants; their advantages and disadvantages.
6- Attends major and subspecialty surgical procedure
7- Capable of leading the surgical team by the end of ST6

Educational activities

1- Actively participates in daily rounds
2- Presents cases in grand rounds and journal clubs and supports juniors

3- Prepares and presents cases in cardiology/CHS meetings
4- Helps in preparation of morbidity and mortality meetings and presents data
5- Attends education activities and courses (local and international)
6- Finalize a clinical research project
7- Organizes the on call rota
8- Allocates duties and tasks to juniors and supervises their execution
9- Participates in ongoing researches and audits

Surgical Procedures that should be performed according to their competence level by the end of ST6

CODE	DESCRIPTION OF PROCEDURE	**Level of Competence**	**Minimum accepted number recorded in logbook (ST3-ST6)**
2.3. CARDIAC PROCEDURES			
TS.2.3.1	SURGICAL INCISIONS IN DIFFERENT AGE GROUPS		
TS.2.3.1.1	Median sternotomy	T5	40
TS.2.3.1.2	Thoracotomy	T3	10
TS.2.3.1.3	Minimally invasive incisions	T2	10
TS. 2.3.2. EXTRACORPOREAL CIRCULATION			
TS. 2.3.2.1	Cannulation and bypass	T5	100
TS. 2.3.2.2	Weaning from bypass	T5	100
TS. 2.3.2.3	Intra-Aortic balloon device	T5	10
TS.2.3.3. MYOCARDIAL PROTECTION & BODY ORGAN PRESERVATION			
TS.2.3.3.1	Myocardial protection during CABG	T4	100
TS.2.3.3.2	Myocardial protection for valvular surgery		100
TS.2.3.3.3	Myocardial protection for congenital heart surgery	T2	30
TS.2.3.3.4	Myocardial protection during beating heart surgery		30

THEME 3. CORONARY ARTERY DISEASE (CAD)			
TS.3.2.1	Saphenous vein harvest	T5	100
TS.3.2.2	Harvesting of Mammary artery	T4	40
TS.3.2.3	Radial artery harvest	T1	5
TS.3.2.4	Proximal coronary anastomosis	T3	50
TS.3.2.5	Distal coronary anastomosis	T3	50
TS.3.2.6	On-pump CABG	T3	30
TS.3.2.7	Off-pump CABG	T2	10
TS.3.2.8	CABG with Valve surgery	T2	10
THEME 4 STRUCTURAL HEART DISEASES			
TS.4.2.1	Aortic valve replacement	T4	50
TS.4.2.2	Aortic valve repair	T1	5
TS.4.3.1	Mitral valve replacement	T4	50
TS.4.3.2	Mitral valve repair.	T3	10
TS.4.3.3	Removal of left atrial thrombus	T3	5
TS 4.4.1	Tricuspid valve repair	T4	10
TS 4.4.2	Tricuspid valve replacement	T2	2
TS.4.7.1	Redo valve surgery	T3	10
TS.4.7.2	Surgery For Emergency/Stuck Valve	T3	10
THEME 5. DISEASES OF AORTA & GREAT VESSELS			
TS.5.2.1	Bentall operation	T2	10
TS.5.2.2	Valve sparing operations	T1	10
TS. 5.3.1	Surgery for pulmonary embolism	T1	5

THEME 6. SURGERY FOR CARDIAC ARRHYTHMIAS			
TS.6.2.1	Ablation for AF	T1	10
TS.6.4.1	Pacemaker Insertion and removal	T2	5
THEME.7 CARDIAC NEOPLASMS AND PERICARDIAL DISEASES			
TS.7.1.1	Surgical resection of cardiac myxoma	T3	5
TS.7.2.1	Pericardiectomy for constrictive pericarditis	T1	5
TS.7.3.1	Pericardial drainage	T4	20
TS.7.3.2	Pleuro-pericardial window	T2	2
THEME 8. SURGERY FOR HEART FAILURE			
TS.8.2.1	Ventricular reconstruction e.g Dor procedure	T1	10
TS.8.2.1	Ventricular assisting devices (VAD)		10
TS.8.3.1	Operative techniques for heart transplant		10
THEME 9. CONGENITAL HEART DISEASE			
TS.9.2.1	ASD closure	T3	20
TS.9.2.2	VSD closure		5
TS.9.2.3	PDA ligation	T2	5
TS.9.2.4	Pulmonary artery banding		5
TS.9.3.1	Cavo pulmonary shunt		5
TS.9.3.2	Repair of TOF		10
TS.9.4.1	Repair of SAM		5
TS.9.4.2	Repair of coarctation of the Aorta		10

THEME 10. THORACIC SURGERY			
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TS.10.2.3.1.2	Minimally invasive incisions	T1	5
TS.10.2.3.2	Diagnostic & therapeutic rigid/fiberoptic brochoscopy (including airway FB removal)	T3	20
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TS.10.7.4	Pectoral flap	T1	5
TS.10.7.5	Omental flap	T1	5

Standards for technical skills

For any given procedure the trainee should be able to explain its pre/intraoperative preparations, steps, indications, contraindications, advantages, disadvantages, complications and outcomes.

Each procedure has a competence level ascribed to it in the areas of technical skills ranging from 1 to 5.

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	reasonable fluency.
T3= Can do under supervision; carries out a straightforward procedure fluently and demonstrates when to call for assistance/advice from the supervisor (knows personal limitations).	T4= Competent to do whole without assistance, including managing complications and adaptation to well-known variations in the procedure encountered
T5= Can teach and supervise his/her junior colleagues to do the procedure	

JOB DESCRIPTION OF THE TRAINER DURING THE TRAINING PROGRAM

1. Provides training and teaching for the trainees according to the provided curriculum and intended learning outcomes and sign a learning agreement with each trainee.
2. Supervises the various activities of the trainees and their logbooks.
3. Ensures and helps trainees for fulfillment of the logbook activities according to the year of training and the required level of competence and signing them.
4. Ensures patient safety in relation to trainee performance by the early recognition and management of those trainees in distress or difficulty.
5. Evaluates the trainees through WPBA and routine training activities with feedback to the trainee, to the educational supervisor and centrally in the trainer monthly report.
6. Performs individual appraisal for trainees at the middle & end of assigned training period (after 3/6 or 6/12 months) and submits their reports (trainee assessment form) to the Egyptian Board
7. Participates as an attendant in the annual review process and in exit examination as nominated or requested by the scientific board

JOB DESCRIPTION OF THE EDUCATIONAL SUPERVISOR DURING THE TRAINING PROGRAM

1- Checks and evaluates the progress of the training program

2- Evaluates the trainers periodical reports and propose remedial actions for any deficiencies

3- Ensures that all training activities are running according to the curriculum

4- Checks the availability of the requirements for training.

5- Checks that each trainee is involved in a research project

6- Assesses the logbook activities of each trainee & provide needed remarks for both trainer & trainees.

7- Ensures the adherence to rotation plan for each trainee

8- Reports to the EF-CHS accreditation committee and scientific board and discuss with them the performance of the trainees and their legibility to sit for the exam

9- Ensure that WPBA is in place and regularly done.

10- Discuss with hospital authorities the administrative affairs of the trainees and propose solutions.

11- Participates in the annual review process and in exit exams as nominated or required by the scientific board.

JOB DESCRIPTION OF THE TRAINING PROGRAM DIRECTOR

1. Advises trainees on all aspeCHS of EF-CHS
2. Ensures that trainees notify the specialty coordinator of their entry into training program at ST3, ST4, ST5 and ST6.
3. Follows the implementation of the curriculum and the planned program of education
4. Supervises the organization of the training sequence
5. Management of rotations across trainers
6. Ensures that each post delivers the education and training expected for that period and provides feedback to the trainers involved in any unsatisfactory reports from trainees
7. In conjunction with the scientific council and the Egyptian board, may withdraw a placement which is considered unsuitable to the needs of the trainee
8. Ensures that the CTD is regularly implemented
9. Monitors logbook entries by regular inspection with the specialty coordinator through the ARP
10. Arranges the ARP meeting with the head of scientific council.
11. Checks that trainees are doing their research projeCHS
12. Arranges for completion of the training post-assessment form by each trainee after the end of each rotation. The training post assessment form is confidential and should only be retained by the specialty coordinator with access rights to the head of the scientific council and Program Director. The Program Director is to give anonymous feedback to training units and ensure any problems highlighted are investigated
13. Advises the scientific council on: the facilities needed for training; and the minimum learning requirements necessary to complete training
14. Exam organization
15. Decides candidate eligibility for sitting for 2nd part exam.

JOB DESCRIPTION OF SPECIALTY COORDINATOR

1- Training management across hospitals and hospital networks

2- Keeps records of trainees' progression in trainees' files

3- Collection and follow up of all forms related to the training process. These forms should be organized and summarized in a suitable spreadsheet reflecting each activities corresponding to trainees, trainers, supervisors and training post.

4- Organization of the training sequence to meet the needs of the trainee

5- Management of rotations across training centers

6- Recruitment of trainers under scientific board supervision

7- Recruitment of trainees in collaboration with the Egyptian Board administration and according to the approved scientific board requirements.

8- Follow up and facilitation of trainers and supervisors activities

9- Liaises with training hospitals' management teams to successfully manage the training program in each training center

10- Coordination of annual review meetings

11- Preparation for and participation in visits for accreditation of training hospitals

12- Follow up on regular Audit of training centers performance which is based on:

   a. Reports from trainers
   b. Reports from educational supervisors

c. Trainee post assessment forms
d. Feedback from program director
e. Reports from the monitoring and evaluation office of the Egyptian Boards.

The specialty coordinator should identify any issues arising from previously mentioned monitoring approaches or as a direct complain from trainees and liaise appropriately with relevant personal to resolve it.

The curriculum for congenital heart surgery (CHS) describes the details of the topics, knowledge, skills and professional behavior learning outcomes that the Egyptian Board of CHS trainee is expected to acquire during his training and demonstrate through various assessment methods, in order to fulfill the requirements of certification and to be able to provide skilled independent congenital heart clinical and surgical care upon graduating the program.

The curriculum outlines standards for the depth of knowledge, levels of performance for clinical and technical skills required by trainees. This will help trainees guide their readings and their choice of learning activities.

The curriculum also describes the core skills, attitude and behavior that should be acquired and demonstrated by trainees to help them to work towards target levels of clinical and surgical proficiency

Depth of Knowledge & Clinical Skill Competence
The following methodology is used to define the relevant depth of knowledge and the level of practical clinical application required to be achieved by each CHS trainee by the end of the training program. Each topic has a competence level ascribed to it ranging from 1 to 4 which indicates the depth of knowledge and clinical skill competence required:

Standards for technical skills
For any given procedure the trainee should be able to explain its pre/intraoperative preparations,

A- Depth of Knowledge & Clinical Skill Competence (KCS)	
L1	A basic knowledge & understanding that does not go much beyond bookwork & general reading. At this level there is only an elementary linkage of cause & effeCHS between basic sciences & clinical conditions including epidemiology, natural history, pathophysiology and pathogenesis.
L2	Deeper knowledge & understanding that allows link & cause & effect to be demonstrated. At this level there is an expectation of a basic ability to define conditions & outline principles of management, the disease process and outcomes.
L3	In depth knowledge & understanding that can where appropriate, be applied to clinical situations. At this level there is an expectation of an ability to gather information through history & clinical examination, select and interpret investigations and synthesize information to risk stratify, draw appropriate conclusions, make diagnosis, formulate the management plan and accordingly safely manage patient operatively/ nonoperatively.
L4	In depth knowledge, analysis and judgment that can where appropriate, be applied to clinical situations. At this level there is an expectation of an ability to recognize and explain complex conditions & processes, to make diagnoses & management. It is also expected that candidates' grasp of subject matter would be sufficient to enable them to justify their conclusions & suggest alternative approaches or explanations on evidence basis.

steps, indications, contraindications, advantages, disadvantages, complications and outcomes.
Each procedure has a competence level ascribed to it in the areas of technical skills ranging from 1 to 5.

<table>
<tr><th colspan="2">B- Levels of Technical Skill (TS) Competence</th></tr>
<tr><td>T1= Observe (Real/Video); Has adequate knowledge of the steps through direct observation.</td><td>T2= Can assist; ability to handle instruments relevant to the procedure appropriately and safely and perform some parts of the procedure with reasonable fluency.</td></tr>
<tr><td>T3= Can do under supervision; carries out a straightforward procedure fluently and demonstrates when to call for assistance/advice from the supervisor (knows personal limitations).</td><td>T4= Competent to do whole without assistance, including managing complications and adaptation to well-known variations in the procedure encountered</td></tr>
<tr><td colspan="2">T5= Can teach and supervise his/her junior colleagues to do the procedure</td></tr>
</table>

Theme 1. BASIC SCIENCES

All trainees must be able to competently apply the knowledge of basic science when interpreting clinical investigations and in the practice of CHS.

1.1. CARDIAC ANATOMY& HISTOLOGY

All trainees must be able to describe the anatomical & histological basis of cardiac and vascular structures. They must apply this knowledge when interpreting clinical symptoms, signs and investigations in the practice of CHS with special emphasis on applied anatomy relevant to clinical methods of assessment, surgical approach and management in cardiac surgery.

KCS.1.1.1	Overview : Heart, Pericardium and mediastinum		L4
KCS.1.1.2	Cardiac Chambers		L4
KCS.1.1.3	Valvular Anatomy		L4
KCS.1.1.4	Anatomy of the conduction system		L3
KCS.1.1.5	Coronary arteries & veins		L4
KCS.1.1.6	Anatomy of vascular system		L2
KCS.1.1.7	Histological structure of the heart and blood vessels		L2
KCS.1.1.8	Anatomical basis of Cardio-Surgical incisions		
	KCS.1.1.8.1	Median sternotomy	L4
	KCS.1.1.8.2.	Thoracosternotomy	L2
	KCS.1.1.8.3.	Thoracotomy	L3
	KCS.1.1.8.4.	Minimally invasive incisions	L2

1.2. CARDIAC PHYISIOLOGY

All trainees must be able to discuss physiological basis of cardiac action and that of systemic and pulmonary circulation. They must apply this knowledge when interpreting clinical symptoms, signs and investigations in the practice of CHS.

KCS.1.2.1	Physiological properties of cardiac cells	**L3**
KCS.1.2.2	Cardiac cycle	
KCS.1.2.3	The pump energetic	
KCS.1.2.4	Coronary blood flow	
KCS.1.2.5	JVP and arterial pulse and heart sounds	
KCS.1.2.6	Blood pressure in different clinical settings	
KCS.1.2.7	Electrophysiological basis of ECG	

1.3. PHARMACOLOGY

All trainees should demonstrate deep understanding of the classification, pharmacokinetics and pharmacodynamics of drugs used in the field of CHS. They must apply this knowledge in patient management.

KCS.**1.3.1**	Drugs pharmacokinetics.	L2
KCS.**1.3.2**	Mode of action, indications, contraindications, interactions and adverse reactions and adequate dosing of cardiovascular drugs.	

KCS.**1.3.3**	EffeCHS of age, body size, organ dysfunction and concurrent illness on drug distribution and metabolism.	L3
KCS.**1.3.4**	Monitoring different drugs used in CHS (e.g. anticoagulants).	
KCS.**1.3.5**	Selection, timing and use of antibiotics	

1.4. CARDIAC PATHOLOGY

All trainees should be able to discuss the pathological basis of different forms of CV diseases. They must apply this knowledge when interpreting clinical symptoms, signs and investigations in the practice of CHS.

KCS.1.4.1	General		
	KCS.1.4.1.1	Response to inflammation	L3
	KCS.1.4.1.2	Blood-surface interactions	
	KCS.1.4.1.3	Tissue-Surface interactions	
	KCS.1.4.1.4	Vascular graft healing	
KCS.1.4.2	Ischemic heart disease		
	KCS.1.4.2.1	Atherosclerosis	L3
	KCS.1.4.2.2	Ischemic myocardial injury	
	KCS.1.4.2.3	Myocrdial Infarction and complications	
KCS.1.4.3	Valvular heart disease		
	KCS.1.4.3.1	Degenerative Aortic calcification	L3
	KCS.1.4.3.2	Mitral annular calcification	
	KCS.1.4.3.3	Rheumatic heart disease	
	KCS.1.4.3.4	Infective endocarditis	
	KCS.1.4.3.5	Myxomatous degeneration of mitral valve	
KCS.1.4.4	Myocardial disease		
	KCS.1.4.4.1	Dilated Cardiomyopathy	L2
	KCS.1.4.4.2	Hypertrophic Cardiomyopathy	
	KCS.1.4.4.3	Restrictive cardiomyopathy	
	KCS.1.4.4.4	Myocarditis	
KCS.1.4.5	Neoplastic heart disease		
	KCS.1.4.5.1	Myxoma	L3
	KCS.1.4.5.2	Primary cardiac tumors	L2

THEME.2. PERIOPERATIVE MANAGEMENT OF CARDIOSURGICAL PATIENTS

All trainees should demonstrate competence in assessing and managing patients eligible for cardiac surgery pre, intra & postoperatively.

2.1. PREORERATIVE MANAGEMENT

2.1.1.History Taking

KCS. 2.1.1.1	Different elements of history • Ischemic symptoms • Left sided heart symptoms • Right sided heart symptoms • Symptoms of infections • Embolic symptoms	L4

2.1.2. Clinical Examination & Assessment

KCS.2.1.2.1	The basis and relevance of physical signs • Vital signs • General physical signs relevant to cardiac diseases • Local signs of cardiac diseases	L4

2.1.3. Pre-Operative laboratory evaluation

KCS.2.1.3.1	Basic routine preoperative lab studies	L4
KCS.2.1.3.2	Disease specific lab studies e.g Inflammatory biomarkers, acute phase reactants, …….etc	

2.1.4. Pre-Operative Imaging

KCS.2.1.4.1	Echocardiography; indications, pattern in different diseases and advanced echocardiography e.g TEE, DSE	L2
KCS.2.1.4.2.	Cardiac catheterization; indications, limitations and complications	
KCS.2.1.4.3.	Multislice-CT (MSCT); indications and limitations	
KCS.2.1.4.4.	Nuclear imaging; methods to assess myocardial viability and their limitations	
KCS.2.1.4.5.	Cardiac MRI; indications and limitations	

2.1.5. Exercise ECG Test

KCS.2.1.5.1	Indications & contraindications for exercise ECG testing	L2

2.1.6. Mortality and morbidity risk assessment

KCS.2.1.6.1	Euroscore for assessment of operative risk in adult cardiac surgery	L4
KCS.2.1.6.2.	Aristotle score for assessment of operative risk in congenital	L 2

	heart surgery	

2.2. NON SURGICAL INTRA-OPERATIVE MANAGEMENT

KCS.2.2.1	Anesthesia in cardiac patients		L2
KCS.2.2.2	Intra operative echocardiography assessment		L2
KCS.2.2.3	Extracorporeal Circulation		
	KCS.2.2.3.1	Perfusion systems components	L4
	KCS.2.2.3.2	Perfusion team	
	KCS.2.2.3.3	Assembly of heart lung machine (HLM) & Priming	
	KCS.2.2.3.4	Deep hypothermic circulatory arrest	
	KCS.2.2.3. 5	Antegrade and retrograde cerebral perfusion	
	KCS.2.2.3. 6	Complications and risk management: Massive air embolism Thrombosis and bleeding	
	KCS.2.2.3. 7	Acute inflammatory response to cardiopulmonary bypass	L2
KCS.2.2.4	Transfusion therapy and blood conservation		
	KCS.2.2.4.1	Autologous blood donation	L3
	KCS.2.2.4.2	Pharmacological strategies for blood conservation	
	KCS.2.2.4.3	Topical hemostatic agents	
	KCS.2.2.4.4	Platelet inhibitors and their effect on blood usage	
KCS.2.2.5	MYOCARDIAL PROTECTION		
	KCS.2.2.5.1	Ischemic and reperfusion injury	L4
	KCS.2.2.5.2	Cardioplegic techniques	
	KCS.2.2.5.3	Systemic hypothermia and elective fibrillatory arrest	
	KCS.2.2.5.4	Non Cardioplegic techniques	
	KCS.2.2.5.5	Myocardial protection during beating heart surgery	
KCS.2.2.6	Temporary circulatory support		
	KCS.2.2.6.1	Intra-Aortic balloon device	L3
	KCS.2.2.6.2	Ventricular assist devices	L2

2.3 Cardiac procedures

TS.2.3.1	SURGICAL INCISIONS IN DIFFERENT AGE GROUPS		
	TS.2.3.1.1	Median sternotomy	T5
	TS.2.3.1.2	Thoracotomy	T3
	TS.2.3.1.3	Minimally invasive incisions	T2
TS. 2.3.2	EXTRACORPOREAL CIRCULATION		
	TS. 2.3.2.1	Cannulation and bypass	T5
	TS. 2.3.2.2	Weaning from bypass	
	TS. 2.3.2.3	Intra-Aortic balloon device	

TS.2.3.3	MYOCARDIAL PROTECTION & BODY ORGAN PRESERVATION		
	TS.2.3.3.1	Myocardial protection during CABG	T4
	TS.2.3.3.2	Myocardial protection for valvular surgery	
	TS.2.3.3.3	Myocardial protection for congenital heart surgery	T2
	TS.2.3.3.4	Myocardial protection during beating heart surgery	

2.4. POSTOPERATIVE CARE OF CARDIAC SURGICAL PATIENTS

KCS.2.4.1	Cardiac Complication anticipation and treatment	L4
KCS.2.4.2	Support of cardiac performance; pharmacological & mechanical	
KCS.2.4.3	Postoperative bleeding; causes & mechanisms	
KCS.2.4.4	Postoperative major organ dysfunction; pathogenesis and management (lungs & pleura, kidney, liver, nervous system, GIT & blood)	

THEME 3. CORONARY ARTERY DISEASE (CAD)

All trainees should demonstrate deep understanding of the pathophysiologic causes and derangement of ischemic heart disease that enable them to carry out assessment and management of patients with ischemic heart diseases and anticipate the sequel of coronary events with consequent application of the appropriate procedure

3.1 Preoperative Evaluation

KCS.3.1.1	Symptoms of cardiac ischemia & ACS (acute coronary syndromes)		L3
KCS.3.1.2	Risk stratification for CAD; SYNTAX score & Euroscore		
KCS.3.1.3	Noninvasive testing for ischemic patients		
KCS.3.1.4	Invasive testing		
	KCS.3.1.4.1	Coronary angiography	
	KCS.3.1.4.2	Multi-slice CT coronary scan	
KCS.3.1.5	Guidelines of coronary revascularization		L 4
KCS.3.1.6	Medical management		L 2
KCS.3.1.7	Percutaneous Coronary Intervention (PCI)		

3.2 Coronary Artery Bypass Grafting (CABG)

KCS.3.2.1	Rationale and history of CABG		L4
KCS.3.2.2	Indications		
KCS.3.2.3	Conduit choice		
KCS.3.2.4	Conventional techniques		
KCS.3.2.5	New Techniques in Coronary Surgery		L2
	KCS.3.2.5.1	OPCAB	
	KCS.3.2.5.2	Minimally invasive coronary surgery	
	KCS 3.4.5.3	Robotically assisted coronary surgery	
	KCS.3.2.5.4	TMLR	L 1
KCS.3.2.6	Postoperative Complications ; Early & Late		L3
KCS.3.2.7	Outcome and Long term results		

KCS.3.2.8	Long term management		
KCS.3.2.9	Redo CABG; indications , preoperative workup, intraoperative techniques & outcomes		
KCS.3.2.10	Combined valve / CABG		
	KCS.3.2.10.1	Pathophysiology	L3
	KCS.3.2.10.2	Preoperative evaluation	
	KCS.3.2.10.3	Combined CABG & aortic valve surgery	
	KCS.3.2.10.4	Combined CABG & mitral valve surgery	
TS.3.2.1	Saphenous vein harvest		T5
TS.3.2.2	Harvesting of Mammary artery		T4
TS.3.2.3	Radial artery harvest		T1
TS.3.2.4	Proximal coronary anastomosis		T3
TS.3.2.5	Distal coronary anastomosis		T3
TS.3.2.6	On-pump CABG		T3
TS.3.2.7	Off-pump CABG		T2
TS.3.2.8	CABG with Valve surgery		T2

3.3 Mechanical Complications of CAD

KCS.3.3.1	Ischemic mitral insufficiency	L3
KCS.3.3.2	Post infarction VSD / VSR	
KCS.3.3.3	Free wall ventricular rupture	
KCS.3.3.4	Left ventricular aneurysms	

3.4 Combined coronary and carotid artery diseases

KCS.3.4.1	Guidelines of combined coronary and carotid artery disease	L3

THEME 4 STRUCTURAL HEART DISEASES

Learning objective

All trainees should demonstrate adequate knowledge and deep understanding of the epidemiology, pathophysiology and clinical presentations of valvular heart diseases that enable them to carry out pre-operative risk assessment and management of these patients and assess the outcomes.

4.1 Perioperative Management

KCS.4.1.1	Risk Assessment And Stratification		L4
KCS.4.1.2	Guidelines and timing for Surgical Intervention		L4
KCS.4.1.3	Valve Design (Configuration, Materials & Biomechanics) & types of Prosthesis		L2
KCS.4.1.4	Complications Of Surgery		
	KCS.4.1.4.1	Valve related complications	L3
	KCS.4.1.4.2	Bleeding and redo surgery	L4

4.2 Aortic Valve Disease

KCS.4.2.1	Etiology & pathologic Anatomy		L3
KCS.4.2.2	PathoPhysiology and heamodynamics		L3
KCS.4.2.3	Natural history & Complications		L3
KCS.4.2.4	Non Operative Management		
	KCS.4.2.4.1	Medical treatment	L3
	KCS.4.2.4.2	TAVI; (indications, contraindications, multidisciplinary team, technique, complications, and outcome)	L 2
KCS.4.2.5	Operative Management		
	KCS.4.2.5.1	Indications, contraindications, risk stratification and guidelines.	L4
	KCS.4.2.5.2	Techniques of Valve Replacement	L3

	KCS.4.2.5.3	Management Of Small Aortic Root	L3
	KCS.4.2.5.4	Homograft and autograft Valve Replacement	L3
	KCS.4.2.5.5	Management of Complications	L3
	KCS.4.2.5.6	Outcomes; Early & Late	L3
TS.4.2.1	Aortic valve replacement		T4
TS.4.2.2	Aortic valve repair		T1

4.3 MITRAL VALVE DISEASE

KCS.4.3.1	Etiology And Pathologic Anatomy		L3
KCS.4.3.2	Natural history and complications		L3
KCS.4.3.3	Non Surgical Management		
	KCS.4.3.3.1	Guidelines of Medical therapy	L2
	KCS.4.3.3.2	Balloon Valve Dilatation	L2
KCS.4.3.4	Surgical Management		
	KCS.4.3.4.1	Techniques Of Mitral Valve Replacement	L4
	KCS.4.3.4.2	Techniques Of Mitral Valve Repair.	L3
	KCS.4.3.4.3	Management of complications	L3
	KCS.4.3.4.4	Outcomes; early and late	L3
TS.4.3.1	Mitral valve replacement		T4
TS.4.3.2	Mitral valve repair.		T3
TS.4.3.3	Removal of left atrial thrombus		T3

4.4 Tricuspid Valve Disease

KCS.4.4.1	Etiology And Pathologic Anatomy		L3
KCS.4.4.2	Natural history & complications		L3
KCS. 4.4.3	Non Surgical management		
	KCS.4.4.3.1 Medical therapy		L3
	KCS.4.4.3.2 Balloon valvuloplasty		
KCS 4.4.4	Surgical Management		
	KCS 4.4.4.1	Guidelines for surgical management	**L4**
	KCS 4.4.4.2	Tricuspid valve repair (indications, contraindications, technique, complications & outcomes)	
	KCS 4.4.4.3	Tricuspid valve replacement (indications, contraindications, technique, complications & outcomes)	
TS 4.4.1	Tricuspid valve repair		**T4**
TS 4.4.2	Tricuspid valve replacement		**T2**

4.5 ENDOCARDITIS

KCS.4.5.1	Etiology & Causative organisms		L3
KCS.4.5.2	Natural History & Complications		L4
KCS.4.5.3	Native & prosthetic valve infective endocarditis		L4
KCS.4.5.4	Non-Surgical Management		L3
KCS.4.5.5	Surgical Management		
	KCS.4.5.5.1	Indications for surgery and guidelines	L4
	KCS.4.5.5.2	Techniques of valve repair and replacement;(aortic root abscess	L3
	KCS.4.5.5.3	Outcomes; Early & Late	L3

4.6 COMBINED VALVE LESIONS

KCS.4.6.1	Multivalvular Lesions	L3
KCS.4.6.2	Congenital Heart Disease & Valve Lesion	L2

4.7 REDO SURGERY

KCS.4.7.1	Techniques, indications, contraindications, complications, and outcomes	**L4**
TS.4.7.1	Redo valve surgery	T3
TS.4.7.2	Surgery For Emergency/Stuck Valve	T3

THEME 5. DISEASES OF AORTA & GREAT VESSELS

Learning Objective
All trainees should demonstrate adequate knowledge and deep understanding of the epidemiology, pathophysiology, classifications and clinical presentations of aortic dissection, aortic aneurysm and pulmonary embolism that enable them to carry out risk assessment and management of patients presenting with these diseases and assess the outcomes.

5.1 Aortic Dissection

KCS.5.1.1	Epidemiology& definitions		L3
KCS.5.1.2	Pathophysiology		
	KCS.5.1.2.1	Atheroma, medial necrosis and arteritis	
	KCS.5.1.2.2	Inherited disorders of vascular biology	
KCS.5.1.3	Natural history, Classifications & Clinical Presentation		
KCS.5.1.4	Diagnosis & Management		
KCS.5.1.5	Outcomes		

5.2 Aortic Aneurysms

KCS.5.2.1	Epidemiology and Natural history		L3
KCS.5.2.2	Pathophysiology		
	KCS.5.2.2.1	Medial degeneration	
	KCS.5.2.2.2	Infections	
	KCS.5.2.2.3	Inflammations	
	KCS.5.2.2.4	Bicuspid aortic valve	
KCS.5.2.3	Classifications and Clinical presentation		
KCS.5.2.4	Non surgical management and outcomes		
KCS.5.2.5	Surgical management and outcomes		
TS.5.2.1	Bentall operation		T2
TS.5.2.2	Valve sparing operations		T 1

KCS.5.3 - Pulmonary Embolism (Acute & Chronic)

KCS.5.3.1	Epidemiology & Pathophysiology	L2
KCS.5.3.2	Clinical presentation & Diagnosis	
KCS.5.3.3	Management & Outcomes	
TS. 5.3.1	Surgery for pulmonary embolism	T 1

THEME 6. SURGERY FOR CARDIAC ARRHYTHMIAS

All trainees should be able to decide when to resort to surgical management for cardiac arrhythmias and apply the basis of main operations in this field

6.1. Cardiac dysrhythmias

KCS.6.1.1	Tachy/ Brady dysrrhythmias	L 2
KCS.6.1.2	ECG diagnosis for dysrhythmia	

6.2. Surgical Management of Atrial Fibrillation

KCS.6.2.1	Anatomical/Electrophysiological basis of Atrial Fibrillation (AF)	L 2
KCS.6.2.2	The Maze procedure	
KCS.6.2.3	Techniques for AF Ablation during Mitral valve surgery	
TS.6.2.1	Ablation for AF	T 1

6.3. Surgical Management of Ventricular Arrhythmias

KCS.6.3.1	Types and initial management	L 2
KCS.6.3.2	Revascularization in treatment of ventricular Arrhythmias	
KCS.6.3.3	Left ventricular reconstruction	

6.4. Pacemakers

KCS.6.4.1	Types of Pace-Makers	L 2
KCS.6.4.2	Indications & Techniques of Pace-Makers insertion	
KCS.6.4.3	Complications & follow-up of Pace-Maker insertion	
TS.6.4.1	Pacemaker Insertion and removal	T 2

6.5. Implantable Automatic defibrillators

KCS.6.5.1	Indications and types	L 1
KCS.6.5.2	Device implantation techniques	

THEME.7 CARDIAC NEOPLASMS AND PERICARDIAL DISEASES

Learning objective: All trainees should be able to differentiate between different types of primary and secondary cardiac neoplasms and apply that to the management of patients. They should demonstrate adequate knowledge and deep understanding that enable them to carry out assessment and treatment of patients with pericardial disease.

7.1 Cardiac tumours

KCS.7.1.1	Cardiac myxoma and management	L3
KCS.7.1.2	Primary cardiac tumors other than myxoma	L 2
KCS.7.1.3	Secondary cardiac tumors	L 1
TS.7.1.1	Surgical resection of cardiac myxoma	T 3

7.2 Pericarditis

KCS.7.2.1	Acute pericarditis (infective, idiopathic or malignant)	L3
KCS.7.2.2	Chronic pericarditis	
KCS.7.2.3	Constrictive pericarditis	
TS.7.2.1	Pericardiectomy for constrictive pericarditis	T 1

7. 3 Pericardial effusion

KCS.7.3.1	Types and classifications		
	KCS.7.3.1.1	Postoperative pericardial effusion	L4
	KCS.7.3.1.2	Malignant pericardial effusion	
KCS.7.3.2	Cardiac tamponade		L4
TS.7.3.1	Pericardial drainage		T 4
TS.7.3.2	Pleuro-pericardial window		T 2

7.4 Pericardial tumours

KCS.7.4.1	Types of pericardial tumours	L1

THEME 8. SURGERY FOR HEART FAILURE

Learning Objective

All trainees must be able to discuss hemodynamics related to heart failure (HF). They must apply this knowledge in diagnosis and management of patient with heart failure and decide when to resort to surgical management.

8.1. Heart Failure

KCS.8.1.1	Etiology and pathophysiology of HF	**L3**
KCS.8.1.2	Restrictive and dilated Cardiomyopathy	
KCS.8.1.3	Complications of HF	
KCS.8.1.4	Medical management and outcome of HF	

8.2. Non transplant Surgical Management

KCS.8.2.1	CABG	L 2
KCS.8.2.2	Valve repair and replacement	
KCS.8.2.3	Dynamic myoplasty e.g latissmus dorsi flap	
KCS.8.2.4	Ventricular reconstruction e.g Dor procedure	
KCS.8.2.5	Resynchronization therapy	
KCS.8.2.6	Biomedical devices	
KCS.8.2.7	Ventricular assisting devices	
KCS.8.2.8	Total artificial heart	
KCS.8.2.9	Stem cell therapy and Tissue engineering	
TS.8.2.1	Ventricular reconstruction e.g Dor procedure	T 1
TS.8.2.2	Ventricular assisting devices (VAD)	

8.3 CARDIAC TRANSPLANTION

KCS.8.3.1	Imunobiology of heart transplant	**L 2**
KCS.8.3.2	Indication and contraindication for heart transplant	
KCS.8.3.3	Recipient selection	
KCS.8.3.4	Donor selection	
KCS.8.3.5	Organ preservation	
KCS.8.3.6	Operative techniques for heart transplant	
KCS.8.3.7	Postoperative complications and management	
KCS.8.3.8	Xenotransplant	
KCS.8.3.9	Retransplant	
TS.8.3.1	Operative techniques for heart transplant	**T 1**

THEME 9. CONGENITAL HEART DISEASE

Learning objective

All trainees should discuss the pathophysiology and hemodynamic changes in CHD and apply this knowledge in management of this patient population

9 .1 BASIC SCIENCE

KCS.9.1.1	Anatomy and embryology	L 3
KCS.9.1.2	Pathophysiology & hemodynamics	
KCS.9.1.3	Types of patches and conduits used in CHD	

9.2. LEFT TO RIGHT SHUNT LESIONS

KCS.9.2.1	Atrial septal defeCHS (ASD) and partial anomalies pulmonary venous drainage (PAPVD)	L 4
KCS.9.2.2	Ventricular septal defeCHS (VSD)	
KCS.9.2.3	Atrioventricular septal defeCHS	
KCS.9.2.4	Patent ductus arteriosus (PDA)	
TS.9.2.1	ASD closure	T 3
TS.9.2.2	VSD closure	
TS.9.2.3	PDA ligation	T 2
TS.9.2.4	Pulmonary artery banding	

9.3. CYANOTIC CHD

KCS.9.3.1	Tetralogy of Fallot (TOF)	L 3
KCS.9.3.2	Duct dependent circulation	
KCS.9.3.3	Univentricular heart	
KCS.9.3.4	Fontan operation	
KCS.9.3.5	Cavo-pulmonary shunts	

KCS.9.3.6	Palliative & definitive surgery (indications, contraindications, complications and outcomes)	
TS.9.3.1	Cavo pulmonary shunt	T 2
TS.9.3.2	Repair of TOF	T 2

9.4 Obstructive CHD

KCS.9.4.1	Aortic coarctation	L 3
KCS.9.4.2	Pulmonary stenosis	
KCS.9.4.3	Interrupted aortic arch	
KCS.9.4.4	Subaortic membrane (SAM)	
TS.9.4.1	Repair of SAM	T 2
TS.9.4.2	Repair of coarctation	

9.5 Grown up congenital heart disease (GUCH)

KCS.9.5.1	Late presentation of CHD	L2
KCS.9.5.2	Management of surgical sequelae of CHD	
KCS.9.5.3	Staged management of CHD	

THEME 10. THORACIC SURGERY

10.1 Basic science

All trainees should be able to discuss the anatomy of the lungs and their relationship to adjacent structures, the physiology of airway mechanics, gas exchange, and blood flow, and the basic respiratory pharmacology and apply this knowledge to clinical methods of assessment and management in the practice of thoracic surgery.

KCS.10.1.1	Anatomy		
	KCS.10.1.1.1	Anatomy of Lungs, pleura and tracheobronchial tree	**L 3**
	KCS.10.1.1.2	Anatomy of Chest wall	
	KCS.10.1.1.3	Anatomical basis of different types of thoracic incisions	
KCS.10.1.2	Physiology		
	KCS.10.1.2.1	Physiology of Respiration	**L 3**
	KCS.10.1.2.2	Physiology of Pleural fluid formation	
	KCS.10.1.2.3.	Physiological basis of pulmonary function tests	
KCS.10.1.3	Pharmacology		
	KCS.10.1.3.1	Bronchodilators	**L 3**
	KCS.10.1.3.2	Corticosteroids	

10.2 Perioperative Management of Patients Undergoing Thoracic Surgery

All trainees should demonstrate competence in assessing and managing patients eligible for thoracic surgery pre, intra & postoperatively.

10. 2.1. PREORERATIVE MANAGEMENT

10.2.1.1.History Taking

KCS. 10. 2.1.1.1	Different elements of history • Local & Systemic symptoms of malignancy • Paraneoplastic syndrome • Symptoms of pleuropulmonary infections • Social & occupational history	L4

10.2.1.2. Clinical Examination & Assessment

KCS.10.2.1.2.1	The basis and relevance of physical signs • Vital signs • General physical signs relevant to chest diseases • Local signs of chest diseases	L4

10. 2.1.3. Pre-Operative laboratory evaluation

KCS.10.2.1.3.1	Basic routine preoperative lab studies	L4
KCS.10.2.1.3.2	Disease specific lab studies e.g tumor markers, …….etc	

10.2.1.4. Pre-Operative Imaging

KCS.10.2.1.4.1	CT chest; types ,indications and limitations	L2
KCS.10.2.1.4.2.	PET-scan; indications & limitations	
KCS.10.2.1.4.3.	Chest MRI; indications and limitations	
KCS.10.2.1.4.4.	Bone scan; indications & limitations	
KCS.10.2.1.4.5.	Ventilation perfusion scan; indications & limitations	

10.2.1.6. Mortality and morbidity risk assessment

KCS.10.2.1.6.1	Thoracoscore for assessment of operative risk in thoracic surgery	L2

10.2.2. NON SURGICAL INTRA-OPERATIVE MANAGEMENT

KCS.10.2.2.1	Anesthesia in thoracic surgery patients	L2
KCS.10.2.2.2	Double lumen endotracheal tubes; indications & complications	L2

10.2.3 Thoracic procedures

TS.10.2.3.1	SURGICAL INCISIONS IN DIFFERENT AGE GROUPS		
	TS.10.2.3.1.1	Thoracotomy	T3
	TS.10.2.3.1.2	Minimally invasive incisions	T1
TS.10.2.3.2	Diagnostic & therapeutic rigid/fiberoptic brochoscopy (including airway foreign body removal)		T3

10.2.4. Postoperative Management

KCS.10.2.4.1	Postoperative pleuropulmonary complications; causes and management	L4
KCS.10.2.4.2	Postoperative bleeding; causes & mechanisms	L3
KCS.10.2.4.3	Postoperative major organ dysfunction	L3
KCS.10.2.4.4	Postoperative air leaks; causes and management	L3
KCS.10.2.4.5	Postoperative pain; mechanisms and management	L2
KCS.10.2.4.6	Late postoperative complications; stump failure & space problems	L2

10.3. Congenital heart trauma

All trainees should be able to assess and manage the different types of congenital heart trauma. In addition they should be able to carry out and supervise advanced life support management of these patients.

KCS.10.3.1	Chest wall trauma	L3
KCS.10.3.2	Traumatic Intrathoracic collections	L4
KCS.10.3.3	Pulmonary trauma	L3
KCS.10.3.4	Tracheobronchial injuries	L3
KCS.10.3.5	Cardiac injuries	L4
KCS.10.3.6	Trauma of the thoracic aorta and great vessels	L4
KCS.10.3.7	Diaphragmatic injuries	L3
KCS.10.3.8	Oesophageal injuries	L2
TS.10.3.1	Thoracotomy in an emergency setting	T 4

10.4. Neoplasms and Infections of the Lung

All trainees should have deep knowledge and understanding that enable them to assess and manage patients with lung infections and primary Lung tumors.

KCS.10.4.1	Pathological classification of malignant lung lesions	L3
KCS.10.4.2	Staging systems for lung cancer	L2
KCS.10.4.3	Multidisciplinary management of lung cancer	L3
KCS.10.4.4	Benign Lung Neoplasms	L2
KCS.10.4.5	The solitary pulmonary nodule	L2
KCS.10.4.6	Secondary pulmonary tumors	L2
KCS.10.4.7	Different types of Lung infection; assessment & management	L3
TS.10.4.1	Lung resections	T 2

10.5. Chest wall Anomalies

All trainees should understand and discuss common congenital chest wall abnormalities and their management.

KCS.10.5.1	Pectus excavatum	L2
KCS.10.5.2	Pectus Carnitaum	

10.6. Diseases of the Pleura

All trainees should have deep knowledge and understanding of the pathophysiology of different types of pleural diseases that enable them in diagnosis and management of patients presenting with these diseases

KCS.10.6.1	Pneumothorax	L4
KCS.10.6.2	Benign and malignant pleural effusions	L3
KCS.10.6.3	Infections of the pleura	L3
KCS.10.6.4	Pleural tumors	L2
KCS.10.6.5	Spontaneous and iatrogenic Chylothorax	L3
TS.10.6.1	Intercostal tube insertion and care in different age groups	T 5
TS.10.6.2	Bullectomy/blebectomy & pleurodesis for pneumothorax	T 2
TS.10.6.3	Pleural effusion drainage	T 3
TS.10.6.4	Decortication for empyema	T 2

10.7 DISORDERS OF THE MEDIASTINUM

All trainees should have deep knowledge and understanding that enable them to diagnose and manage patients with mediastinal lymphoma and infections and urgently manage patients with superior vena caval syndrome.

KCS.10.7.1	Mediastinal lymphoma	L3
KCS.10.7.2	Other mediastinal masses	L 1
KCS.10.7.3	Mediastinal infections	L3
KCS.10.7.4	Superior vena caval syndrome	L3
TS.10.7.1	Mediastinal mass biopsy	T1
TS.10.7.2	Drainage of mediastinal infections	T3

TS.10.7.3	Rewiring & dewiring of the sternum	T4
TS .10.7.4	Pectoral flap	T1
TS .10.7.5	Omental flap	T1

CORE COMPETENCIES

CC.1 Clinical Assessment and Management

All trainees should be able to:

CC.1.1 Take a directed clinical history from a patient, (which is appropriate for the clinical problem and the individual patient's needs).

CC.1.2 Examine the patient both generally & and regionally (heart and chest).

CC.1.3 Formulate an evaluation plan for appropriate medical, laboratory, and imaging examinations.

CC.1.4 Prioritize, select and interpret relevant investigation

- **CC.1.4.1** Laboratory tests
- **CC.1.4.2** ECG, exercise test
- **CC.1.4.3** Chest x-ray, CT & MRI
- **CC.1.4.4** Echocardiography; TTE, TEE & DSE
- **CC.1.4.5** Coronary angiography
- **CC.1.4.6** Multislice CT, coronary scan & cardiac MRI
- **CC.1.4.7** Nuclear imaging
- **CC.1.4.8** Pulmonary function tests

CC.1.5 Construct a diagnosis and differential diagnosis.

CC.1.6 Plan for treatment (surgical or non-surgical) and whether surgery is palliative or definitive and identify the need of emergency surgery.

CC.1.7 Assess morbidity and mortality risk factors

CC.1.8 Decide suitability for cardio-thoracic surgery

CC.1.9 Explain the perioperative process and likely outcome to the patient and/or relatives or care givers and confirm understanding.

CC.1.10 Take an informed consent.

CC.2 Preoperative planning

All trainees should be able to

CC.2.1 Make a sound surgical decision and select appropriate operative strategies/techniques to deal with the specific condition

CC.2.2 Choose with reasoning appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays, ECG, ….etc.

CC.2.3 Check materials, equipment and device requirements and CBP machine with operating room staff.

CC.3 Intra operative preparation

All trainees should be able to:

CC.3.1 Recheck in theatre that consent has been obtained

CC.3.2 Ensure proper and safe positioning of the patient on the operating table

CC.3.3 Demonstrate careful skin preparation

CC.3.4 Demonstrate careful draping of the patient’s operative field

CC.3.5 Ensure general equipment and materials are deployed safely (e.g. catheter, diathermy)

CC.4 Exposure and closure

All trainees should be able to:

CC.4.1 Select the proper skin incision

CC.4.2 Complete a sound hemostasis and wound closure in layers after inserting proper drainage system as ICT.

CC.4.3 Protect the wound with dressings

CC.5 Intra operative Technique

All trainees should be able to:

CC.5.1 Follow an agreed, logical sequence or protocol for the procedure
CC.5.2 Consistently handle tissue well with minimal damage
CC.5.3 Control bleeding promptly by an appropriate method
CC.5.4 Demonstrate a sound technique of knots and sutures.
CC.5.5 Use instruments appropriately and safely
CC.5.6 Identify types of CBP types, cannulation sites, size and types according to type of the operation
CC.5.7 Anticipate and respond appropriately to variation e.g. anatomy
CC.5.8 Deal calmly and effectively with unexpected events/complications
CC.5.9 Use assistant(s) to the best advantage at all times
CC.5.10 Communicate clearly and consistently with the scrub team
CC.5.11 Communicate clearly and consistently with the anesthetist

CC.6 Post operative management

All trainees should:

CC.6.1 Ensure safe patient transfer from the operating table to ICU bed
CC.6.2 Construct a clear operative note
CC.6.3 Manage patient in the postoperative ICU, ward and outpatient clinic
CC.6.3 Monitor & Support cardiac performance e.g using inotropes and assisted devices
CC.6.4 Monitor & support various organ performance; lungs, kidneys, nervous system & Gastrointestinal system
CC.6.5 Anticipate and manage postoperative complications
- CC.6.5.1 Cardiac tamponade
- CC.6.5.2 Dehiscence of the sternum and surgical site complications
- CC.6.5.3 Postoprative bleeding
- CC.6.5.4 Pleuropulmonary complications

CC.6.6 Perform competently Cardiopulmonary resuscitation
CC.6.7 Decide the need for re-exploration and competently perform it .

ATTITUDES & BEHAVIOR

AB.1. Good clinical care

All trainees must maintain the centrality of the best interest of the patient through the consistent application of ethical codes to all aspeCHS of assessment, treatment and case management. This applies in particular to:

AB.1.1 Patient's medical History: All trainees must show empathy with patients. Appreciate the importance of psychological factors for patients and relatives. Appreciate the interaction of social factors and the patient's illness.

AB.1.2 Patient's Examination: All trainees must respect patients' dignity and confidentiality, acknowledge cultural issues, appropriately involve relatives. Appreciate situations where there is the need for a chaperone.

AB.1.3 Investigations including imaging: All trainees must use a widely accepted diagnostic system to assist in making the diagnosis and differential diagnosis in each case. They must be able to provide explanations to patients as to rationale for investigations, limitations and possible unwanted effeCHS.

AB. 1.4 Treatment (Operative & Nonoperative): All trainees must clearly and openly explain treatments options, their side effeCHS and complications.

AB.1.5 Management of chronic disease: All trainees must treat each patient as an individual. Appreciate the effeCHS of the disease states on patients and their relatives.

AB.1.6 Compassionate approaches to patient care: All trainees must be compassionate in how they manage patients.

AB.1.7 Patient safety: All trainees must demonstrate awareness of patient safety in a practical situation and put safety and care of patients first.

AB.1.8 Providing treatment in emergencies: All trainees must be able to carry out their responsibilities in a timely fashion. They must be able to deal with emergency and crisis situations as they arise and review and reschedule workplan accordingly.

AB.1.9 All trainees must respond to any complaint about their own clinical practice in a professional manner and ensure that the clinical care of the patient is not compromised. They must respond to complaints about the clinical practice of other health service professionals in a sensitive and professional manner.

AB.2 Maintaining good medical practice

All trainees must recognize the limits of their competence and always work for maintaining and improving their professional competence. They must:

AB.2.1 Keep up-to-date.

AB.2.2 Maintain and improve their practice

AB.3 Teaching and Training, Appraising and Assessing

AB. 3.1 All trainees must demonstrate a willingness, enthusiasm and ability to contribute to the teaching and training of students and other healthcare colleagues

AB.3.2 All trainees must be honest and objective when appraising or assessing the performance of colleagues. They must provide only honest, justifiable and accurate comments.

AB. 4 Relationship with patients

Trainees should be able to establish a doctor/patient/relatives relationship characterized by good communication, understanding, trust, respect, empathy and confidentiality.

AB.4.1 Doctor-patient partnership: All trainees must adopt a non-discriminatory attitude to all patients and recognize their needs as individuals. They must involve patients in clinical decision making. They must accept that a patient may make a decision about their management that appears to contradict clinical advice.

AB. 4.2 Good communication: All trainees must be able to communicate effectively and sensitively.

AB. 4.3 Consent: All trainees must be able to obtain valid consent from the patient according to national guidelines. They must be aware of, and be able to respond to, the patient's level of understanding and mental state and how this may impair their capacity for informed consent.

AB. 5 Working with colleagues

Trainees should recognize their own limitations and understand the importance of co-operation and team working with other healthcare professionals involved in patient care.

AB.5.1 Work cooperatively as part of a multi-professional clinical team and accept, where appropriate, the role of the leader of the team.

AB.5.2 Arrange cover

AB. 5.3 Share information with colleagues

AB. 6 Probity

AB.6.1 Being honest and trustworthy. All trainees must demonstrate honesty and openness in any financial arrangements with patients by not putting pressure on patients to accept private treatment,

providing information about fees and charges before obtaining patients' consent to treatment, not exploiting patients' vulnerability or lack of medical knowledge when making charges for treatment or services and ensure that their practice conforms to codes of practice.

AB.6.2 Writing reports and CVs, giving evidence and signing documents: All trainees must demonstrate an appropriate knowledge of gathering, organizing and providing evidence. Demonstrate an understanding that the purpose of these reports is to inform the judges and facilitate them in decision-making. Use appropriate language, for example avoiding use of medical jargon and write concise and precise reports.

AB.6.3 ConfliCHS of interest: They should declare any relevant financial or commercial interest.

AB. 7 Trainee Health

AB. 7.1 All trainees must take appropriate steps to protect patients when their own health is affected by illness or disability.

AB. 7.2 All trainees must protect themselves, their colleagues and their patients by being immunized against vaccine preventable diseases (HBV, influenza,…etc)

AB. 7.3 Trainees must be able to recognize the manifestations of infectious diseases that require work restriction.

Sources for Study

A. Basic sources

1. John Hopkins manual of congenital heart surgery
2. Cardiac surgery in adults by Cohn
3. Congenital heart disease by Richard Jonnas
4. Oxford handbook of congenital heart surgery by Chikwie
5. TSRA Review of congenital heart surgery
6. Surgery for CHD Deleval and Strak
7. Pediatric cardiac surgery by Constantene Mavarodis
8. Key questions in cardiac surgery

B. Journals (Last 3 years)

1. Annals of thoracic surgery
2. Operative Techniques in Cardiac and Thoracic Surgery
3. Seminars in Thoracic and Cardiovascular Surgery
4. Pediatric Cardiac Surgery Annual
5. The Egyptian journal of congenital heart surgery

Themes			2nd part		3rd part				
			MCQ	Short Essay	OSPE	Long Case	Short Case	History/ Com. Skill	WPBA
1. Basic sciences	1.1	Cardiac anatomy & histology	√	√	√				
	1.2	Cardiac physiology	√						
	1.3	Cardiac pharmacology	√						
	1.4	Cardiac pathology	√	√					
2.Perioperative management of Cardiosurgical Patients	2.1.	Pre-operative management	√	√	√	√	√	√	√
	2.2.	Non surgical intra-operative management	√	√		√	√		√
	2.3.	Cardiac procedures							√
	2.4	Postoperative care of cardiac surgical patients	√	√				√	√
nary Arter y Disea se (CAD	3.1	Preoperative evaluation	√	√	√		√	√	√

	3.2	Coronary artery bypass grafting	√	√					√
	3.3	Mechanical complications of cad	√	√					
	3.4	Combined coronary and carotid artery diseases	√	√					
4. Structural Heart Diseases	4.1	Perioperative management	√	√		√		√	
	4.2	Aortic valve disease	√	√		√			√
	4.3	Mitral valve disease	√	√		√			√
	4.4	Tricuspid valve disease	√	√		√			√
	4.5	Endocarditis	√	√		√			√
	4.6	Combined valve lesions	√	√		√			
	4.7	Redo surgery	√	√					√
5. Diseases of the aorta & Great vessels	5.1	Aortic dissection	√	√	√				
	5.2	Aortic aneurysms	√	√	√				√
	5.3	Pulmonary embolism (acute & chronic)	√						

6. Surgery For Cardiac Arrhythmias	**6.1.**	**Cardiac dysrhythmias**	√		√				
	6.2.	**Surgical management of atrial fibrillation**	√						
	6.3.	**Surgical management of ventricular arrhythmias**	√						
	6.4.	**Pacemakers**	√						√
	6.5	**Implantable automatic defibrillators**	√						
7. Cardiac Neoplasms & Pericardial Diseases	7.1	Cardiac tumours	√	√	√				√
	7.2	Pericarditis	√						
	7.3	Pericardial effusion	√		√				√
	7.4	Pericardial tumours	√						
8. Surgery for Heart failure	8.1.	Heart failure	√						
	8.2	Non transplant surgical management	√						
	8.3	Cardiac transplantion	√						

9. Surgery for congenital Heart diseases	9 .1	Basic science	√						
	9 .2	Left to right shunt lesions	√	√	√		√		√
	9 .3	Cyanotic CHD	√	√	√		√		√
	9 .4	Obstructive CHD	√	√	√		√		√
	9 .5	Grown up congenital heart disease (GUCH)	√	√	√		√		√
10. Thoracic surgery	10.1	Basic science	√						
	10.2	Perioperative management of patients undergoing thoracic surgery	√	√	√		√	√	√
	10.3	Congenital heart trauma	√	√	√				√
	10.4	Neoplasm and infections of the lung	√	√	√		√		√
	10.5	Chest wall anomalies	√		√			√	
	10.6	Diseases of the pleura	√	√	√		√		√

	10.7	Disorders of the mediastinum	√	√	√				√
Core Competence	CC.1	Clinical assessment & management				√	√	√	√
	CC.2	Preoperative planning				√	√		√
	CC.3	Intra-operative preparation							√
	CC.4	Exposure & closure							√
	CC.5	Intra-operative technique							√
	CC.6	Post-operative management							√
Attitude & behavior	AB.1	Good clinical care				√	√	√	√
	AB.2	Maintaining good medical practice							√
	AB.3	Teaching & training							√
	AB.4	Relationship with patients				√	√	√	√
	AB.5	Working with colleagues							√
	Ab.6	Probity						√	√
	AB.7	Occupational health							√

MARKS & STANDARDS

Themes	Second part Written Exam MCQ (200 marks) MEQs (200 marks)	Third part Clinical Exam (400 marks)	
		OSPE (100 marks)	Clinical cases & OSCE (300 marks)
1	40	√	-
2	60	√	
3	60	-	50
4	60	-	100
5	40	√	-
6	20	√	-
7	20	√	-
8	20	√	-
9	40	-	50
10	40	-	50
CC & AB	-	-	50

1) First part exam is the general surgery first part exam
2) Second part exam.

At the end of ST6 the candidate is allowed to sit for the second part exam after acceptance of the log book, attainment of ARP "5" and presentation and acceptance of his clinical research paper).

This is a written exam.
This exam is divided into 4 papers (2 MCQs papers and 2 SNQs) on 4 separate sessions over 2 days, 2 sessions every day

a. Paper 1 100 MCQs for 100 marks
b. Paper 2 short essay questions for 100 marks
c. Paper 3 100 MCQs for 100 marks
d. Paper 4 short essay questions for 100 marks

The candidates are allowed to sit for the 2nd part exam after the end of their training program and allowed for re-sit exam 2 times after the first attempt. Duration between each attempt is 12 months.

After the permission of the program director and provided achieving ARP "1" by the end of ST5, the trainee may be allowed to sit for 2nd part exam at the end of ST5 and allowed for re-sit exam 2 times after the first attempt. Duration between each attempt is 12 months.

Candidate has to pass the written exam to be eligible to sit for the third part. The pass mark will be determined by Angoff method.

FORMAT OF THE EXAMINATION

There are two written exam forms; short essay notes and multiple choice papers. Each MCQ paper comprises 100 questions with a single best answer. Each question consists of an initial stem followed by 5 possible answers, identified A, B, C, D and E. Candidates should select one item they believe to be correct. There is no negative marking.

3) Third part exam.

Only candidates who pass the 2nd part exam are allowed to enter the 3rd part exam

Candidates who passed the 2nd part exam after ST5 are only allowed to enter the 3rd part exam at the end of ST6 and after acceptance of their log book, attainment of ARP "5" and presentation and acceptance of their clinical research paper).

Candidate performance in Clinical Competencies will be assessed by means of Objective Structured Practical Examinations (OSPEs) arranged in (20) stations. Clinical exams (one long case, 3 short cases and 1 station history &communication skills; counselling, consent, ...etc).

For Clinical exams; pass mark in stations will be calculated according to the borderline regression method.

For OSPE; pass mark is calculated by Modified Angoff method.

SECTIONS OF CLINICAL EXAM

a) 20 OSPE stations are of 100 marks; stations will compensate each other.
b) 3 short cases and 1 history & communication skills (200 marks; 50 each) (stations compensate for each other)
c) 1 Long case (100 marks).

The candidate has to pass each section **INDEPENDENTLY** to pass the 3rd part exam; **NO COMPENSATION** between sections.

The candidates who fail to pass the third part exam are allowed to re-sit for 3rd part only 2 times maximum. Duration between each attempt is 12 months.

Those candidates who fail 2nd/3rd part exam after completion of CHS training program will be affiliated for an extra year to a training centre in order to ensure maintenance and improvement of their competencies and **THEY WILL BEAR ALL THE TRAINING FEES FOR THIS EXTRA YEAR.**

TIMING AND VENUE

The written examination is held once/ year at the Egyptian fellowship building, Cairo, Egypt. The clinical exam is held once per year and the timing is announced by the fellowship administration.

4) **Workplace based assessment:** The surgical skills, common competencies and attitude & behaviour will be assessed through:
    a. The log book (LB), in which 75% of all its items concerning the clinical attendance, the observation, assistance or performance of surgical procedures should be fulfilled.
    b. Procedure based assessment forms (10 procedures will be assessed at the workplace)
    c. Trainee assessment forms
    d. Trainer monthly report
    e. Supervisor reports
    All gathered and assessed in annual review process (ARP) meeting.