

**Dr.NTR University of Health Sciences**

**Vijayawada**

## **SYLLABUS**

**“POST DOCTORAL FELLOWSHIP  
COURSE IN CARDIAC ANAESTHESIA”**

**for the academic year 2018-19**

1. Name of the information Course: Fellowship course in cardiac anaesthesia
2. Duration of the course: One year
3. Eligibility Criteria for admission: MD / D.N.B in Anaesthesiology recognised by MCI/National Board of Examinations.

Intake capacity: 2 per year.

4. Complete curriculum of the course:

a. **Goal**:

The goals and objectives of the course are to produce competent anaesthesiologists to cater to the need of cardiac anaesthesia and to make him aware of the recent advances and developments in cardiac anaesthesia.

b. **Objectives**:

- To train the candidates in the principles and practice of cardiac anaesthesia, and cardiopulmonary resuscitation.
- To train the fellow to master the use of advanced technology and instrumentation to monitor the status of patients for cardio thoracic surgery.
- The fellow will be trained to develop skills in working as a team for the care of the patient undergoing cardiothoracic surgery
- Training will be given to develop skills in teaching and research related to cardiac anaesthesia in the areas of acute care and rehabilitation.
- The trainee will be expected to devise policies and establish procedures for the individual management of patients depending up on their health status and the nature of surgery.
- To provide care and intensive monitoring of pre and post operative periods.
- To develop the department of cardiac anaesthesia as a specialty including patient care, teaching/training and research.
- To develop the spirit of collaboration, co-operation and leadership among the involved disciplines and to evolve as an efficient team.

5. Course Content:

The candidate must have gained experience in the diagnosis and treatment of patients with serious medical and surgical disease including coronary artery disease. The present document defines the minimum content of this one year of training in cardiac anaesthesia and deals with two aspects – The knowledge about pathophysiology, diagnosis and treatment of a series of disease processes and a list of specific procedures and interventions that the candidate must be able to perform.

### **5.1 Basic medical sciences:**

Anatomy, pathophysiology of cardiac and thoracic disease, pharmacology, pre-anaesthesia check up, anaesthetic management, post operative care including intensive care.

### **5.2 Respiratory disorders**

Management of airways (including upper airways obstruction), pulmonary edema, adult respiratory distress syndrome and hypercapnic respiratory failure, severe asthma, chest trauma, respiratory muscle disorders, thoracic surgery.

### **5.3 Cardiovascular disorders**

Haemodynamic instability and shock, cardiac arrest acute myocardial infarction and unstable angina severe heart failure, common arrhythmias and conduction disturbance, specific cardiac disorders (cardiomyopathies, valvular heart disease, atrial or ventricular septal defects, myocarditis), cardiac tamponade, pulmonary embolism, aortic dissection, hypertensive crisis, peripheral vascular diseases. Cardiovascular surgery. Cardio pulmonary resuscitation (CPR) Training in Basic Life Support (BLS), and Advance Life Support (ALS)

### **5.4 Neurological disorders**

Coma, cerebrovascular accidents, cerebral vasospasm, acute neuromuscular disease (including myasthenia), post anoxic brain damage, acute confusional states, spinal cord injury, brain death.

### **5.5 Renal disorders**

Oliguria. Acute renal failure, renal replacement therapy

### **5.6 Metabolic and Nutritional disorders**

Fluid electrolyte and acid-base disorders, endocrine disorders (including diabetes), nutritional requirements, monitoring of nutrition.

### **5.7 Haematological disorders**

Disseminated intravascular coagulation and other coagulation disorders, anaemia, blood component therapy, and immunological conditions like myasthenia gravis. Monitoring coagulation status and anticoagulation, thrombolytic therapy, fibrinolytics, cell salvage methods and blood conservation techniques.

### **5.8 Infections**

Severe infection due to aerobic and anaerobic bacteria, viruses, fungal and parasites, nosocomial infection, infection in the immunocompromised, antimicrobial therapy, immunotherapy.

### **5.9 Gastro-intestinal disorders**

Acid peptic disease, acute and chronic liver failure, prevention and treatment of acute G.I. Bleeding (including variceal bleeding), gastric paresis etc.

### **5.10 Environmental Hazards:**

Hypo-and hyperthermia, radiation hazards in the cardiac catheterization suites.

### **5.11 Toxicology, poisoning**

Drug overdose, serious adverse reactions, and anaphylaxis.

### **5.12 General:**

Pharmacology, pharmacokinetics and drug interactions. Analgesia, sedation and muscle relaxants, inflammation and anti-inflammatory agents, multiple trauma, transport of the critically ill, multisystem disorders (including Multi-Organ Dysfunction syndrome MODS and the Systemic Inflammatory Response Syndrome SIRS) Management of the organ donor.

### **5.13 Intervention and procedure**

The cardiac anaesthesiologist must be able to perform a number of specific procedures; for all candidates experience is desirable but not mandatory in the following area.

- **Respiratory**  
Emergency Cricothyrotomy (desirable), Percutaneous tracheostomy, different modes of ventilation, techniques of weaning from mechanical ventilation in adult and paediatric patients, placement of an intercostal tube, fiberoptic Bronchoscopy (desirable) interpretation of arterial and mixed venous blood gases, assessment of gas exchange and respiratory mechanics.
- **Cardiovascular:**  
Placement of a central venous catheter (by different routes), pulmonary artery (Swan Ganz) catheter, an arterial catheter (by different routes) measurement and interpretation of the hemodynamic variables (including the derived variables), implementation of cardiovascular support both pharmacological and mechanical, antiarrhythmic therapy and thrombolysis. Transthoracic and transesophageal echocardiography in adults and children in the perioperative period.
- **Neurologic:**  
Basic interpretation of CT/MRI scan (desirable) Central nervous system function monitoring (BIS, etc.)
- **Metabolic and Nutritional**  
Implementation of Enteral and parental nutrition in adult and paediatric patients, management of glycemic status.
- **Haematologic:**  
Correction of haemostatic and coagulation disorders, interpretation of a coagulation profile including TEG, implementation of thrombolysis.
- **Renal:**  
Renal support techniques (desirable).
- **Gastro-intestinal:**  
Esophageal and gastric tamponade balloon
- **General:**

Measurement of severity of illness and outcome assessment. Exposure to clinical research (desirable) ethical and legal aspects perioperative cardiac patient care (desirable)

#### **5.14 General Topics:**

- Research methodology
- Teaching methodology

### **6. Framework of Training:**

#### **1. Teaching and learning methodology:**

- Clinical case discussion
- Morbidity-mortality discussion
- Audit presentation
- Lectures, seminars and journal clubs
- Presentation of progress report on the research projects
- Simulation laboratory
- Joint inter-departmental academic meets with radiology, microbiology, etc.
- Departmental clinical meetings, grand rounds and clinico-pathological meetings
- Multi-departmental combined grand rounds/joint academic activities of the institution.

#### **2. Clinical and practical training:**

- The candidates should follow full time in-service residency and should be given increasing responsibilities on a gradual basis for independently managing complicated, cardiac and cardiothoracic cases.
- Teaching and training of students shall include graded all round patient care responsibility including resuscitation and clinical diagnosis.
- Training in thorough and holistic patient evaluation
- Training in ABC (airway, breathing and circulation) including practical training and complete understanding of airway armamentarium, breathing circuits, rapid sequence intubation, initiation-maintenance-termination of mechanical ventilation, invasive or non-invasive hemodynamic monitoring and safe insertion of central venous and intra-arterial catheters, etc.
- The fellow will also participate in ICU procedures supervised by ICU trained professionals.
- The fellow will acquire clinical and practical skills in pre-anaesthetic evaluation and acute post operative care along with administering anaesthesia to children and adults with cardiac illness.

#### **3. Postings: 12 months in the Department of cardiac anaesthesia including Special Postings in the following Departments**

- Cardio thoracic OT - 8 months
- Post anaesthesia care - 30 days
- Pre anaesthesia evaluation - 15 days
- Perfusion technology training - 15 days
- Pediatric ICU - 15 days
- ICCU - 15 days
- Interventional Procedures - 30 days

Candidates will have to be on duty 24\*7 days.  
Attendance: 80% attendance as per the University regulations.

#### 4. Presentations:

In addition to attending all the academic sessions, the candidate needs to make a minimum number of presentations in these academic sessions during the training period of 1 year

	<b>Frequency #</b>
<b>Presentations</b>	
a. Seminars / Symposia	1 per month
b. Journal club	1 per month
c. Research conference at state level - 1	
d. Research conference at national level - 1	
e. Clinical case conference	1 per month
f. Bedside presentation	1 per month
g. Interdepartmental meeting with Radiology / cardiology and others	1 per month
h. Grand rounds	1 per week
i. Mortality meeting and audit meeting	1 per month
j. Record meetings	Once in 2 weeks
k. Teaching learning process will also take place during the daily ward rounds and during teaching rounds	

# May be increased if required.

#### 5. Log Book:

Logbook of daily activity should be maintained by the candidate where in all the departmental procedures, extra departmental procedures, case presentations, observations, seminars, journal clubs, etc will be regarded periodically inspected by the guide for formative assessment during the residency program.

The guide should provide frequent and constructive feed back to the trainee on regular basis about the overall integrated coherent and longitudinal assessment and to provide suggestions for improvement in the performance.

## 6. Reference Books:

- Clinical Practice of Cardiac Anaesthesia by Deepak K. Tempe.
- Kaplan's Cardiac Anesthesia: The Echo Era, 6th Edition By Joel A. Kaplan, MD, David L. Reich, MD and Joseph S. Savino, MD.
- A Practical Approach to Cardiac Anesthesia by Frederick A. Hensley, Glenn P. Gravlee, Donald E. Martin.
- Complications in anaesthesia by Atlee, John
- High yield thoracic pathology by Hussain
- Manual of Pediatric anaesthesia by Lerman, Jerrold
- Nadas Pediatric cardiology by Keane, John
- Perioperative medicine by Newman, Mark
- The Johns Hopkins manual of cardiac surgical care by Conte, John.
- The MGH text book of Anaesthetic equipment by Sandberg, Warren.

## 7. Suggested Journals:

- Annals of Cardiac Anaesthesia
- Journal of Cardiothoracic Anesthesia
- The Journal of Cardiothoracic and Vascular Anesthesia by Elsevier
- Anaesthesiology clinics of North America
- Journal of clinical Anaesthesia
- Anaesthesia and intensive care medicine
- Operative techniques in thoracic and cardiovascular surgery: a comparative
- Seminars in thoracic and cardiovascular surgery
- Seminars in thoracic and cardiovascular surgery: Paediatric cardiac surgery
- The Journal of thoracic and cardiovascular surgery

➤ Thoracic surgery clinics